

DEPARTMENT OF APPLIED STATISTICS  
UNIVERSITY OF LONDON, UNIVERSITY COLLEGE

TRACTS FOR COMPUTERS

EDITED BY  
KARL PEARSON

No. XII

✓ TABLES OF THE PROBABLE ERROR OF THE  
COEFFICIENT OF CORRELATION AS FOUND  
BY THE PRODUCT MOMENT METHOD

BY  
KARL HOLZINGER, PH.D.  
(UNIVERSITY OF CHICAGO)

*With an INTRODUCTORY NOTE by the EDITOR*

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# TABLES OF THE PROBABLE ERROR OF THE COEFFICIENT OF CORRELATION AS FOUND BY THE PRODUCT MOMENT METHOD

*Introduction.* (1) The use of the coefficient of correlation is now so general that rapid methods of writing down its probable error are in considerable demand. According to the nature of the problem under consideration the probable error may be needed to two, three, four, very rarely to more decimal places. It has to be found from the formula

$$\text{P.E. of } r = .6744898 \times (1 - r^2)/\sqrt{N},$$

where  $r$  is the correlation coefficient, and  $N$  is the size of the population or of the universe under discussion.

This formula must be applied only if the value of  $r$  has been determined by the product moment method. But its usefulness is limited by other considerations as well. The very term "probable error" assumes that  $r$  may for practical purposes be treated as following a normal law of frequency. If it does not approximate to such a distribution, the "probable error" of  $r$  as represented by the above formula will be far from an adequate guide in questions of absolute and relative significance. The divergence of the distribution of  $r$  from normality depends upon two considerations, the size of  $N$  and the size of  $r$ . When  $N$  is small we obtain distributions of  $r$ , which even in the case of small correlation differ so markedly from normality, that no reasoning from a normal curve is justifiable. Such populations or samples are termed "small samples," and their treatment is entirely different from that of "large samples." The frequency curves for "small samples" have been tabled in *Biometrika*, Vol. XI, pp. 379 *et seq.*, and these frequency curves must be used for "small samples," not the Gaussian curve. They are very skew curves and the results deduced from them may differ widely from those based on the normal curve.

Now the limit to "small sample" is largely a matter of judgment with regard to the particular problem under discussion. As a rule probable errors are only used to test significance in a rough and approximate manner, and we shall attain our purpose if in a very broad way the normal distribution indicates the frequency of the correlation coefficient. Even for  $N = 20$ , a good deal can be learnt of the distribution of  $r$  from the normal curve, if we do not suppose  $r$  to exceed 0.3 in value. For a sample of 50 we might extend the application for many purposes to  $r = 0.4$  for one of 100 to 0.6, and for one of 400 possibly to 0.9. For a sample of 20 to apply the normal curve to distributions of  $r$  for  $r = 0.7$ , or *a fortiori* for  $r = 0.9$  could only be misleading.

We have begun our table at  $N = 20$  with some hesitation, and have given the p.e. of  $r$  for high values, but we warn the reader that these entries of probable error are of small meaning. In all such cases direct reference should be made to the actual distributions of  $r$  in "small samples" as tabled in Vol. XI of *Biometrika*,

and the validity of any conclusion drawn from the probable error tested upon these distributions. Having given this warning to all who may use this table, we will proceed to consider methods of dealing with the actual formula

$$r = .6744898 \times (1 - r^2)/\sqrt{N}.$$

The first factor is given in Table V of the *Tables for Statisticians*, the second factor  $(1 - r^2)$  is given in Table VIII of that work, *without interpolation*, if  $r$  and its p.e. are only required to three decimal places. If we need the p.e. to four decimal places, linear interpolation is adequate. For example, consider  $r = .2957$ , the difference of  $1 - r^2$  for .295 and .296 is 591, which gives 414 to be subtracted from the value .912975 of  $1 - r^2$  for .295, i.e. the answer is .912561, while the exact value is .91256151; thus we are out a half-unit in the seventh figure, a result of no importance if we need the probable error only to four decimals. But the custom is now very general of simply looking up the square of  $r$ —in our case .2957 in *Barlow's Tables*—subtracting it at sight from unity, putting the answer directly on the arithmometer, and multiplying it by the desired value of  $.6744898/\sqrt{N}$  from Table V. This method is so expeditious that short of a table giving the p.e. for all values of  $r$  and  $N$ , it seems impossible to better it.

Why then is it desirable to have an additional table of probable errors? The answer is a simple one. While the professional statistician or computer is certain to have a machine at his disposal, many persons are now using the correlation coefficient who have not such material aids for use, and do not want to do a long multiplication or use logarithms. It is for this fairly large class of students and of the teachers, who are occasionally concerned with correlation, that this tract is prepared. If it be used with discretion—i.e. in due and wholesome fear of the pitfalls of small sampling—and in close accordance with the rules given below, the probable errors of  $r$  can be written down with hardly any labour, and with great expedition. The process depends entirely on the use of proportional parts.

(2) The Tables consist of two sections A and B.

(i) Table A contains *all* values of  $N$  from 20 to 100 by units, and there is no need therefore of correcting for  $N$ . We have only to correct for  $\delta r$ , namely, the difference in *excess* of the observed  $r$  from the next lowest recorded  $r$ . For example, if  $N = 69$  and  $r = .4531$ , the probable error of the next lowest recorded  $r$ , .44, is .0655,  $\delta r$  is 131. Now  $\Delta p$ , the difference between the probable errors of the two recorded  $r$ 's of .44 and .46, is 15, and we look up for 15 the proportional parts corresponding to 1, 3, 1 or arranging them thus\*:

75
225
75
9825

\* To avoid confusion it is convenient to place throughout a vertical rule in the corrections between what will be the fourth and fifth decimal places in the probable error. To

insure last figure accuracy the numbers to the right of the rule should of course be retained until the final correction to the probable error is made.

each proportional part being extended one figure to the right of the previous one. The result is 9825. We adjust this as a fractional part of 15, i.e. it is clearly  $9/8$ , or we must subtract 10 from .0655-. The answer is .0645-. The exact value of  $.6744898 \{1 - (.4531)^2\} / \sqrt{69}$  is .064529 or .0645+ to four decimal places. Thus we should be correct if we showed four figures, but wrong in the third figure, if we cut down to three! On the other hand, had we retained the complete 9.825, instead of representing it by 10, we should have been only one unit wrong in the sixth figure. Let us take another illustration, namely, to find the probable error of .7219 for a population of 87. The nearest tabled  $r$  is .72 with the value .0348; the probable error of  $r = .74$  is .0327, or  $r\Delta p$  is 21. The computer must now be cautious and read 019 for his  $\delta r$ . The first figure of  $\delta r$  is always 0 or 1 according as the second figure of  $r$  is even or odd, and to remember this 0 is important for the adjustment of the proportional parts. We look these out for  $r\Delta p = 21$  and for 0, 1, 9, and have

$$\begin{array}{r} 00 \\ 105 \\ 945 \\ \hline 1095 \end{array}$$

The adjustment indicated by the vertical rule is always one figure from the right of the first entry, or the part of 21 to be subtracted is 1.995 or 2 from .0348; the answer is consequently .0346. The correct value is .034,628, so that the answer is exact to the fourth figure as required.

One further illustration may suffice. Let us find the probable error of  $r = .8797$  for  $N = 32$ . This is in the dangerous field, and is only used to illustrate the exactness of our method of proportional parts.  $\delta r = 197$ ,  $r\Delta p$  is 41 and the scheme is

$$\left. \begin{array}{r} .0310 - 205 \\ 1845 \\ \hline 1435 \end{array} \right\} \text{or } -40/385,$$

or .0269,615, i.e. to four figures .0270. The correct value is .0269,622, so that we still meet with close accordance.

(ii) Table B contains values of  $N$  from 100 to 1000 advancing by 10's; the values of  $r$  increase by .02 as before. In this case we have to obtain the full correction for the probable error  $\Delta p$ , to add together the two corrections  $r\Delta p$  for  $\delta r$  and  $r\Delta p$  for  $\delta N$ . We thus note just as before the proportional part that  $\delta r$  is of  $r\Delta p$ , consisting of three entries, and further the proportional part that  $\delta N$  is of  $r\Delta p$  from the proportional parts tables; we add these together, adjusting the vertical rule and subtract from the immediately lower value of the probable error. Of course the proportional part of  $r\Delta p$  must be put with its right-hand digit immediately above the right-hand digit of the first contribution of  $\delta r$ .

Thus suppose we require the P.E. of  $r = .1526$  for a population of 147. The next lowest probable error is .0559 for  $r = .14$  and  $N = 140$ . Thus  $\delta r = 126$  and  $\delta N = 7$ , starting from .0559 the next P.E. on its right is .0565 or  $r\Delta p = 4$ . Again the next P.E. immediately below it is .0540 or  $r\Delta p = 19$ . We now turn to the Table of Proportional Parts for  $r\Delta p$ , and find under 19

for 7 the value 133. Only one such item is ever required for  $\delta N$ . Three items are required for  $\delta r$ , and must be taken from the  $\delta r$  table for  $r\Delta p = 4$ . We thus have the scheme:

$$\begin{array}{r} \text{correction for } \delta N \quad 133 \\ \text{correction for } \delta r \quad \left\{ \begin{array}{l} 20 \\ 40 \\ 120 \end{array} \right. \\ \hline 15820 \end{array}$$

Adjusting the vertical rule at one digit from the right for either the 133 or the 20, we find that we must subtract 16 from .0559, or .0543 is the required probable error. Had we subtracted 15/82, the answer would have been .0543,18 as against the correct value .0543,36, or we are two units out in the fifth place but correct to the fourth as we hope usually to be.

As another illustration take the P.E. of  $r = .4675$  for  $N = 384$ ,

$$\delta r = 075, \quad \delta N = 4, \\ r\Delta p = 7, \quad r\Delta p = 4.$$

$$\begin{array}{r} \text{The scheme is} \quad 16 \quad \text{for } \delta N, \\ \quad 00 \\ \quad 245 \quad \left. \vphantom{\begin{array}{l} 16 \\ 00 \end{array}} \right\} \text{for } \delta r, \\ \quad \hline \quad 4225 \end{array}$$

or, the required P.E. is .0273 - .0004 = .0269. The correct value is .0268,97 or we are again accurate to four figures.

As a further illustration let us seek the P.E. of  $r = .9783$  for  $N = 168$ ,

$$\delta r = 183, \quad \delta N = 8, \\ r\Delta p = 21, \quad r\Delta p = 1.$$

We have from the Table of Proportional Parts:

$$\begin{array}{r} \text{for } \delta N \quad 08 \quad \text{Answer: } -.0042 - .0020, \\ \text{for } \delta r \quad \left\{ \begin{array}{l} 105 \\ 840 \\ 315 \end{array} \right. \quad \text{or: } -.0022. \\ \quad \hline \quad 20015 \end{array}$$

The correct value is .0022,34, agreeing to the fourth place.

Other comparable values from Table A are:

	$N=20, r=.9753$	$N=39, r=.3568$	$N=42, r=.9731$
By Tables	P.E. = .00736	P.E. = .09424	P.E. = .00551
Actual	P.E. = .00736	P.E. = .09426	P.E. = .00552

of which, of course, the first and last are of doubtful application, owing to the values of  $N$  and  $r$ .

Other comparisons from Table B are:

	$N=126, r=.4768$	$N=457, r=.6499$	$N=973, r=.8351$
By Tables	P.E. = .04644	P.E. = .01821	P.E. = .00657
Actual	P.E. = .04643	P.E. = .01822	P.E. = .00654

It is thus amply clear that the Tables suffice in all parts to give the probable error of the coefficient of correlation, found by the product moment method, correct for practical purposes to four decimal places.

K. P.

# TABLES OF THE PROBABLE ERROR OF

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### PROPORTIONAL PARTS TO ENTRIES, page 5

Correction  $\Delta p$  = Proportional Part of  $\Delta p$  only.  
 (This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  $\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450
11	00	55	110	165	220	275	330	385	440	495
12	00	60	120	180	240	300	360	420	480	540
13	00	65	130	195	260	325	390	455	520	585
14	00	70	140	210	280	350	420	490	560	630
15	00	75	150	225	300	375	450	525	600	675
16	00	80	160	240	320	400	480	560	640	720



# THE COEFFICIENT OF CORRELATION

TABLE A. Values of  $N = 20$  to 100

$N = 20$  to 60

Coefficient of Correlation  $r$

$r = .00$  to  $.26$

$N$	.00	.02	.04	.06	.08	.10	.12	.14	.16	.18	.20	.22	.24	.26	$N$
20	.1508	.1508	.1506	.1503	.1499	.1493	.1486	.1479	.1470	.1459	.1448	.1435 <sup>+</sup>	.1421	.1406	20
21	.1472	.1471	.1470	.1467	.1462	.1457	.1451	.1443	.1434	.1424	.1413	.1401	.1397	.1372	21
22	.1438	.1437	.1436	.1433	.1429	.1424	.1417	.1410	.1401	.1391	.1380	.1368	.1355 <sup>+</sup>	.1341	22
23	.1406	.1406	.1404	.1401	.1397	.1392	.1386	.1379	.1370	.1361	.1350 <sup>+</sup>	.1338	.1325 <sup>+</sup>	.1311	23
24	.1377	.1376	.1375	.1372	.1368	.1363	.1357	.1350	.1342	.1332	.1322	.1310	.1297	.1284	24
25	.1349	.1348	.1347	.1344	.1340	.1335 <sup>+</sup>	.1330	.1323	.1314	.1305 <sup>+</sup>	.1295 <sup>+</sup>	.1284	.1271	.1258	25
26	.1323	.1322	.1321	.1318	.1314	.1310	.1304	.1297	.1289	.1280	.1270	.1259	.1247	.1233	26
27	.1298	.1298	.1296	.1293	.1290	.1285 <sup>+</sup>	.1279	.1273	.1265	.1256	.1246	.1235 <sup>+</sup>	.1223	.1210	27
28	.1275	.1274	.1273	.1270	.1267	.1262	.1256	.1250	.1242	.1233	.1224	.1213	.1201	.1188	28
29	.1252	.1252	.1250 <sup>+</sup>	.1248	.1244	.1240	.1234	.1228	.1220	.1212	.1202	.1192	.1180	.1168	29
30	.1231	.1231	.1228	.1227	.1224	.1219	.1214	.1207	.1200	.1192	.1182	.1172	.1161	.1148	30
31	.1211	.1211	.1209	.1207	.1204	.1199	.1194	.1188	.1180	.1172	.1163	.1153	.1142	.1130	31
32	.1192	.1192	.1190	.1188	.1185	.1180	.1175 <sup>+</sup>	.1169	.1162	.1154	.1145	.1135	.1124	.1112	32
33	.1174	.1174	.1172	.1170	.1167	.1162	.1157	.1151	.1144	.1136	.1127	.1117	.1107	.1095	33
34	.1157	.1156	.1155	.1153	.1149	.1145 <sup>+</sup>	.1140	.1134	.1127	.1119	.1110	.1101	.1090	.1079	34
35	.1140	.1140	.1138	.1136	.1133	.1129	.1124	.1118	.1111	.1103	.1094	.1085	.1074	.1063	35
36	.1124	.1124	.1122	.1120	.1117	.1113	.1108	.1102	.1095 <sup>+</sup>	.1088	.1079	.1070	.1059	.1048	36
37	.1109	.1108	.1107	.1105	.1102	.1098	.1093	.1087	.1080	.1073	.1064	.1055 <sup>+</sup>	.1045	.1034	37
38	.1094	.1094	.1092	.1090	.1087	.1083	.1078	.1073	.1066	.1059	.1050 <sup>+</sup>	.1041	.1031	.1020	38
39	.1080	.1080	.1078	.1076	.1073	.1069	.1064	.1059	.1052	.1045 <sup>+</sup>	.1037	.1028	.1018	.1007	39
40	.1066	.1066	.1065	.1063	.1060	.1056	.1051	.1046	.1039	.1032	.1024	.1015	.1005 <sup>+</sup>	.9994	40
41	.1053	.1053	.1052	.1050	.1047	.1043	.1038	.1033	.1026	.1019	.1011	.1002	.9993	.9982	41
42	.1041	.1040	.1039	.1037	.1034	.1030	.1026	.1020	.1014	.1007	.9999	.9990	.9981	.9970	42
43	.1029	.1028	.1027	.1025	.1022	.1018	.1014	.1008	.1002	.9995 <sup>+</sup>	.9987	.9979	.9969	.9959	43
44	.1017	.1016	.1015 <sup>+</sup>	.1013	.1010	.1007	.1002	.9997	.9991	.9984	.9976	.9968	.9958	.9948	44
45	.1005 <sup>+</sup>	.1005 <sup>+</sup>	.1004	.1002	.9999	.9995 <sup>+</sup>	.9991	.9986	.9980	.9973	.9965 <sup>+</sup>	.9957	.9948	.9938	45
46	.9994	.9994	.9993	.9991	.9988	.9985	.9980	.9975	.9969	.9962	.9955	.9946	.9937	.9927	46
47	.9984	.9983	.9982	.9980	.9978	.9974	.9970	.9965	.9959	.9952	.9944	.9936	.9927	.9917	47
48	.9974	.9973	.9972	.9970	.9967	.9964	.9960	.9954	.9949	.9942	.9935	.9926	.9917	.9908	48
49	.9964	.9963	.9962	.9960	.9957	.9954	.9950	.9945	.9939	.9932	.9925	.9917	.9908	.9898	49
50	.9954	.9953	.9952	.9950 <sup>+</sup>	.9948	.9944	.9940	.9935 <sup>+</sup>	.9929	.9923	.9916	.9908	.9899	.9889	50
51	.9944	.9944	.9943	.9941	.9938	.9935 <sup>+</sup>	.9931	.9926	.9920	.9914	.9907	.9899	.9890	.9881	51
52	.9935 <sup>+</sup>	.9935	.9934	.9932	.9929	.9926	.9922	.9917	.9911	.9905 <sup>+</sup>	.9898	.9890	.9881	.9872	52
53	.9926	.9926	.9925 <sup>+</sup>	.9923	.9921	.9917	.9913	.9908	.9903	.9896	.9889	.9882	.9873	.9864	53
54	.9918	.9917	.9916	.9915	.9912	.9909	.9905	.9900	.9894	.9888	.9881	.9873	.9865	.9856	54
55	.9909	.9908	.9908	.9906	.9904	.9900	.9896	.9892	.9886	.9880	.9873	.9865 <sup>+</sup>	.9857	.9848	55
56	.9901	.9901	.9900	.9898	.9896	.9892	.9888	.9884	.9878	.9872	.9865 <sup>+</sup>	.9858	.9849	.9840	56
57	.9893	.9893	.9892	.9890	.9888	.9884	.9881	.9876	.9871	.9864	.9858	.9850 <sup>+</sup>	.9842	.9833	57
58	.9886	.9885	.9884	.9882	.9880	.9877	.9873	.9868	.9863	.9857	.9850	.9843	.9835	.9826	58
59	.9878	.9878	.9877	.9875	.9872	.9869	.9865	.9861	.9856	.9850	.9843	.9836	.9828	.9819	59
60	.9871	.9870	.9869	.9868	.9865	.9862	.9858	.9854	.9848	.9843	.9836	.9829	.9821	.9812	60

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS OF ENTRIES, page 7

Correction  $\Delta p$  = Proportional Part of  $r\Delta p$  only.

(This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  $r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$r\Delta p$	0	1	2	3	4	5	6	7	8	9
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450
11	00	55	110	165	220	275	330	385	440	495
12	00	60	120	180	240	300	360	420	480	540
13	00	65	130	195	260	325	390	455	520	585
14	00	70	140	210	280	350	420	490	560	630
15	00	75	150	225	300	375	450	525	600	675
16	00	80	160	240	320	400	480	560	640	720
17	00	85	170	255	340	425	510	595	680	765
18	00	90	180	270	360	450	540	630	720	810
19	00	95	190	285	380	475	570	665	760	855
20	00	100	200	300	400	500	600	700	800	900
21	00	105	210	315	420	525	630	735	840	945
22	00	110	220	330	440	550	660	770	880	990
23	00	115	230	345	460	575	690	805	920	1035
24	00	120	240	360	480	600	720	840	960	1080
25	00	125	250	375	500	625	750	875	1000	1125
26	00	130	260	390	520	650	780	910	1040	1170
27	00	135	270	405	540	675	810	945	1080	1215
28	00	140	280	420	560	700	840	980	1120	1260
29	00	145	290	435	580	725	870	1015	1160	1305
30	00	150	300	450	600	750	900	1050	1200	1350
31	00	155	310	465	620	775	930	1085	1240	1395



TABLE A (continued)

 $N = 20$  to  $60$ Coefficient of Correlation  $r$  $r = .28$  to  $.52$ 

$N$	$.26$	$.28$	$.30$	$.32$	$.34$	$.36$	$.38$	$.40$	$.42$	$.44$	$.46$	$.48$	$.50$	$.52$	$N$
20	.1406	.1390	.1372	.1354	.1334	.1313	.1290	.1267	.1242	.1216	.1189	.1161	.1131	.1100	20
21	.1372	.1356	.1339	.1321	.1302	.1281	.1259	.1236	.1212	.1187	.1160	.1133	.1104	.1074	21
22	.1341	.1325+	.1309	.1291	.1272	.1252	.1230	.1208	.1184	.1160	.1134	.1107	.1079	.1049	22
23	.1311	.1296	.1280	.1262	.1244	.1224	.1203	.1181	.1158	.1134	.1109	.1082	.1055	.1026	23
24	.1284	.1269	.1253	.1236	.1218	.1198	.1178	.1157	.1134	.1110	.1085+	.1060	.1033	.1005	24
25	.1258	.1243	.1228	.1211	.1193	.1174	.1154	.1133	.1111	.1088	.1064	.1038	.1012	.0984	25
26	.1233	.1219	.1204	.1187	.1170	.1151	.1132	.1111	.1089	.1067	.1043	.1018	.0992	.0965+	26
27	.1210	.1196	.1181	.1165+	.1148	.1130	.1111	.1090	.1069	.1047	.1023	.0999	.0974	.0947	27
28	.1188	.1175	.1160	.1144	.1127	.1109	.1091	.1071	.1050	.1028	.1005	.0981	.0956	.0930	28
29	.1168	.1154	.1140	.1124	.1108	.1090	.1072	.1052	.1032	.1010	.0987	.0964	.0939	.0914	29
30	.1148	.1135	.1121	.1105+	.1089	.1072	.1054	.1034	.1014	.0993	.0971	.0948	.0924	.0898	30
31	.1130	.1116	.1102	.1087	.1071	.1054	.1036	.1018	.0998	.0977	.0955+	.0932	.0909	.0884	31
32	.1112	.1099	.1085+	.1070	.1055	.1038	.1020	.1002	.0982	.0962	.0940	.0918	.0894	.0870	32
33	.1095	.1082	.1068	.1054	.1038	.1022	.1005	.0986	.0967	.0947	.0926	.0904	.0881	.0857	33
34	.1079	.1066	.1053	.1038	.1023	.1007	.0990	.0972	.0953	.0933	.0912	.0890	.0868	.0844	34
35	.1063	.1051	.1037	.1023	.1008	.0992	.0975+	.0958	.0939	.0919	.0899	.0877	.0855+	.0832	35
36	.1048	.1036	.1023	.1009	.0994	.0978	.0962	.0944	.0928	.0907	.0886	.0865+	.0843	.0820	36
37	.1034	.1022	.1009	.0995+	.0981	.0965+	.0949	.0931	.0913	.0894	.0874	.0853	.0832	.0809	37
38	.1020	.1008	.0996	.0982	.0968	.0952	.0936	.0919	.0901	.0882	.0863	.0842	.0821	.0798	38
39	.1007	.0995+	.0983	.0969	.0955+	.0940	.0924	.0907	.0890	.0871	.0852	.0831	.0810	.0788	39
40	.0994	.0983	.0970	.0957	.0943	.0928	.0912	.0896	.0878	.0860	.0841	.0821	.0800	.0778	40
41	.0982	.0971	.0959	.0946	.0932	.0917	.0901	.0885	.0868	.0849	.0830	.0811	.0790	.0769	41
42	.0970	.0959	.0947	.0934	.0920	.0906	.0890	.0874	.0857	.0839	.0821	.0801	.0781	.0759	42
43	.0959	.0948	.0936	.0923	.0910	.0895+	.0880	.0864	.0847	.0829	.0811	.0792	.0771	.0750+	43
44	.0948	.0937	.0925+	.0913	.0899	.0885+	.0870	.0854	.0837	.0820	.0802	.0783	.0763	.0742	44
45	.0938	.0927	.0915	.0903	.0889	.0875+	.0860	.0845	.0828	.0811	.0793	.0774	.0754	.0734	45
46	.0927	.0917	.0905	.0893	.0880	.0866	.0851	.0835+	.0819	.0802	.0784	.0765+	.0746	.0726	46
47	.0917	.0907	.0895+	.0883	.0870	.0856	.0842	.0826	.0810	.0793	.0776	.0757	.0738	.0718	47
48	.0908	.0897	.0886	.0874	.0861	.0847	.0833	.0818	.0802	.0785+	.0768	.0749	.0730	.0710	48
49	.0898	.0888	.0877	.0865	.0852	.0839	.0824	.0809	.0794	.0777	.0760	.0742	.0723	.0703	49
50	.0889	.0879	.0868	.0856	.0844	.0830	.0816	.0801	.0786	.0769	.0752	.0734	.0715+	.0696	50
51	.0881	.0870	.0859	.0848	.0835+	.0822	.0808	.0793	.0778	.0762	.0745	.0727	.0708	.0689	51
52	.0872	.0862	.0851	.0840	.0827	.0814	.0800	.0786	.0770	.0754	.0737	.0720	.0702	.0682	52
53	.0864	.0854	.0843	.0832	.0819	.0806	.0793	.0778	.0763	.0747	.0730	.0713	.0695	.0676	53
54	.0856	.0846	.0835+	.0824	.0812	.0799	.0785+	.0771	.0756	.0740	.0724	.0706	.0688	.0670	54
55	.0848	.0838	.0828	.0816	.0804	.0792	.0778	.0764	.0749	.0733	.0717	.0700	.0682	.0664	55
56	.0840	.0831	.0820	.0809	.0797	.0785	.0771	.0757	.0742	.0727	.0711	.0694	.0676	.0658	56
57	.0833	.0823	.0813	.0802	.0790	.0778	.0764	.0750+	.0736	.0720	.0704	.0688	.0670	.0652	57
58	.0826	.0816	.0806	.0795	.0783	.0771	.0758	.0744	.0729	.0714	.0698	.0682	.0664	.0646	58
59	.0819	.0809	.0799	.0788	.0777	.0764	.0751	.0738	.0723	.0708	.0692	.0676	.0659	.0641	59
60	.0812	.0802	.0792	.0782	.0770	.0758	.0745	.0731	.0717	.0702	.0687	.0670	.0653	.0635+	60

## PROPORTIONAL PARTS OF ENTRIES, page 9

Correction  $\Delta p$  = Proportional Part of  $r\Delta p$  only.(This is to be *subtracted* after adjustment of decimal place)Proportional Parts of  $r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$r\Delta p$	0	1	2	3	4	5	6	7	8	9
18	00	90	180	270	360	450	540	630	720	810
19	00	95	190	285	380	475	570	665	760	855
20	00	100	200	300	400	500	600	700	800	900
21	00	105	210	315	420	525	630	735	840	945
22	00	110	220	330	440	550	660	770	880	990
23	00	115	230	345	460	575	690	805	920	1035
24	00	120	240	360	480	600	720	840	960	1080
25	00	125	250	375	500	625	750	875	1000	1125
26	00	130	260	390	520	650	780	910	1040	1170
27	00	135	270	405	540	675	810	945	1080	1215
28	00	140	280	420	560	700	840	980	1120	1260
29	00	145	290	435	580	725	870	1015	1160	1305
30	00	150	300	450	600	750	900	1050	1200	1350
31	00	155	310	465	620	775	930	1085	1240	1395
32	00	160	320	480	640	800	960	1120	1280	1440
33	00	165	330	495	660	825	990	1155	1320	1485
34	00	170	340	510	680	850	1020	1190	1360	1530
35	00	175	350	525	700	875	1050	1225	1400	1575
36	00	180	360	540	720	900	1080	1260	1440	1620
37	00	185	370	555	740	925	1110	1295	1480	1665
38	00	190	380	570	760	950	1140	1330	1520	1710
39	00	195	390	585	780	975	1170	1365	1560	1755
40	00	200	400	600	800	1000	1200	1400	1600	1800
41	00	205	410	615	820	1025	1230	1435	1640	1845
42	00	210	420	630	840	1050	1260	1470	1680	1890
43	00	215	430	645	860	1075	1290	1505	1720	1935
44	00	220	440	660	880	1100	1320	1540	1760	1980
45	00	225	450	675	900	1125	1350	1575	1800	2025
46	00	230	460	690	920	1150	1380	1610	1840	2070

TABLE A (continued)

 $N = 20$  to  $60$ Coefficient of Correlation  $r$  $r = .52$  to  $.76$ 

$N$	$.52$	$.54$	$.56$	$.58$	$.60$	$.62$	$.64$	$.66$	$.68$	$.70$	$.72$	$.74$	$.76$	$N$
20	.1100	.1068	.1035 <sup>+</sup>	.1001	.0965 <sup>+</sup>	.0928	.0890	.0851	.0811	.0769	.0726	.0682	.0637	20
21	.1074	.1043	.1010	.0977	.0942	.0906	.0869	.0831	.0791	.0751	.0709	.0666	.0622	21
22	.1049	.1019	.0987	.0954	.0920	.0885 <sup>+</sup>	.0849	.0812	.0773	.0733	.0693	.0651	.0607	22
23	.1026	.0996	.0965 <sup>+</sup>	.0933	.0900	.0866	.0830	.0794	.0756	.0717	.0677	.0636	.0594	23
24	.1005	.0975 <sup>+</sup>	.0945 <sup>+</sup>	.0914	.0881	.0848	.0813	.0777	.0740	.0702	.0663	.0623	.0582	24
25	.0984	.0956	.0926	.0895 <sup>+</sup>	.0863	.0830	.0796	.0761	.0725 <sup>+</sup>	.0688	.0650	.0610	.0570	25
26	.0965 <sup>+</sup>	.0937	.0908	.0878	.0847	.0814	.0781	.0747	.0711	.0675	.0637	.0598	.0559	26
27	.0947	.0920	.0891	.0861	.0831	.0799	.0766	.0733	.0698	.0662	.0625 <sup>+</sup>	.0587	.0548	27
28	.0930	.0903	.0875	.0846	.0816	.0785	.0753	.0719	.0685 <sup>+</sup>	.0650 <sup>+</sup>	.0614	.0577	.0538	28
29	.0914	.0887	.0860	.0831	.0802	.0771	.0739	.0707	.0673	.0639	.0603	.0567	.0529	29
30	.0898	.0872	.0845 <sup>+</sup>	.0817	.0788	.0758	.0727	.0695 <sup>+</sup>	.0662	.0628	.0593	.0557	.0520	30
31	.0884	.0858	.0832	.0804	.0775 <sup>+</sup>	.0746	.0715 <sup>+</sup>	.0684	.0651	.0618	.0583	.0548	.0512	31
32	.0870	.0845	.0818	.0791	.0763	.0734	.0704	.0673	.0641	.0608	.0574	.0539	.0504	32
33	.0857	.0832	.0806	.0779	.0751	.0723	.0693	.0663	.0631	.0599	.0565 <sup>+</sup>	.0531	.0496	33
34	.0844	.0819	.0794	.0768	.0740	.0712	.0683	.0653	.0622	.0590	.0557	.0523	.0489	34
35	.0832	.0808	.0783	.0757	.0730	.0702	.0673	.0643	.0613	.0581	.0549	.0516	.0482	35
36	.0820	.0796	.0772	.0746	.0719	.0692	.0664	.0634	.0604	.0573	.0541	.0509	.0475	36
37	.0809	.0786	.0761	.0736	.0710	.0683	.0655	.0626	.0596	.0566	.0534	.0502	.0468	37
38	.0798	.0775 <sup>+</sup>	.0751	.0726	.0700	.0674	.0646	.0618	.0588	.0558	.0527	.0495 <sup>+</sup>	.0462	38
39	.0788	.0765 <sup>+</sup>	.0741	.0717	.0691	.0665	.0638	.0610	.0581	.0551	.0520	.0489	.0456	39
40	.0778	.0756	.0732	.0708	.0683	.0657	.0630	.0602	.0573	.0544	.0514	.0482	.0450 <sup>+</sup>	40
41	.0769	.0746	.0723	.0699	.0674	.0648	.0622	.0595	.0566	.0537	.0507	.0477	.0445	41
42	.0759	.0737	.0714	.0691	.0666	.0641	.0614	.0587	.0560	.0531	.0501	.0471	.0440	42
43	.0750 <sup>+</sup>	.0729	.0706	.0683	.0658	.0633	.0607	.0581	.0553	.0525	.0495 <sup>+</sup>	.0465 <sup>+</sup>	.0434	43
44	.0742	.0720	.0698	.0675	.0651	.0626	.0600	.0574	.0547	.0519	.0490	.0460	.0430	44
45	.0734	.0712	.0690	.0667	.0644	.0619	.0594	.0568	.0541	.0513	.0484	.0455	.0425	45
46	.0726	.0704	.0683	.0660	.0636	.0612	.0587	.0561	.0535	.0507	.0479	.0450	.0420	46
47	.0718	.0697	.0675 <sup>+</sup>	.0653	.0630	.0606	.0581	.0555 <sup>+</sup>	.0529	.0502	.0474	.0445 <sup>+</sup>	.0416	47
48	.0710	.0690	.0668	.0646	.0623	.0599	.0575	.0549	.0523	.0497	.0469	.0440	.0411	48
49	.0703	.0683	.0661	.0639	.0617	.0593	.0569	.0544	.0518	.0491	.0464	.0436	.0407	49
50	.0696	.0676	.0655	.0633	.0610	.0587	.0563	.0538	.0513	.0486	.0459	.0432	.0403	50
51	.0689	.0669	.0648	.0627	.0604	.0581	.0558	.0533	.0508	.0482	.0455	.0427	.0399	51
52	.0682	.0663	.0642	.0621	.0599	.0576	.0552	.0528	.0503	.0477	.0450 <sup>+</sup>	.0423	.0395 <sup>+</sup>	52
53	.0676	.0656	.0636	.0615	.0593	.0570	.0547	.0523	.0498	.0473	.0446	.0419	.0391	53
54	.0670	.0650 <sup>+</sup>	.0630	.0609	.0587	.0565 <sup>+</sup>	.0542	.0518	.0493	.0468	.0442	.0415 <sup>+</sup>	.0388	54
55	.0664	.0644	.0624	.0604	.0582	.0560	.0537	.0513	.0489	.0464	.0438	.0411	.0384	55
56	.0658	.0638	.0619	.0598	.0577	.0555	.0532	.0509	.0485	.0460	.0434	.0408	.0381	56
57	.0652	.0633	.0613	.0593	.0572	.0550	.0527	.0504	.0480	.0456	.0430	.0404	.0377	57
58	.0646	.0627	.0608	.0588	.0567	.0545 <sup>+</sup>	.0523	.0500	.0476	.0452	.0427	.0401	.0374	58
59	.0641	.0622	.0603	.0583	.0562	.0541	.0518	.0496	.0472	.0448	.0423	.0397	.0371	59
60	.0635 <sup>+</sup>	.0617	.0598	.0578	.0557	.0536	.0514	.0491	.0468	.0444	.0419	.0394	.0368	60

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS TO ENTRIES, page 11

Correction  $\Delta p$  = Proportional Part of  $\Delta p$  only.(This is to be *subtracted* after adjustment of decimal place)Proportional Parts of  $\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$\Delta p$	0	1	2	3	4	5	6	7	8	9
28	00	140	280	420	560	700	840	980	1120	1260
29	00	145	290	435	580	725	870	1015	1160	1305
30	00	150	300	450	600	750	900	1050	1200	1350
31	00	155	310	465	620	775	930	1085	1240	1395
32	00	160	320	480	640	800	960	1120	1280	1440
33	00	165	330	495	660	825	990	1155	1320	1485
34	00	170	340	510	680	850	1020	1190	1360	1530
35	00	175	350	525	700	875	1050	1225	1400	1575
36	00	180	360	540	720	900	1080	1260	1440	1620
37	00	185	370	555	740	925	1110	1295	1480	1665
38	00	190	380	570	760	950	1140	1330	1520	1710
39	00	195	390	585	780	975	1170	1365	1560	1755
40	00	200	400	600	800	1000	1200	1400	1600	1800
41	00	205	410	615	820	1025	1230	1435	1640	1845
42	00	210	420	630	840	1050	1260	1470	1680	1890
43	00	215	430	645	860	1075	1290	1505	1720	1935
44	00	220	440	660	880	1100	1320	1540	1760	1980
45	00	225	450	675	900	1125	1350	1575	1800	2025
46	00	230	460	690	920	1150	1380	1610	1840	2070
47	00	235	470	705	940	1175	1410	1645	1880	2115
48	00	240	480	720	960	1200	1440	1680	1920	2160
49	00	245	490	735	980	1225	1470	1715	1960	2205
50	00	250	500	750	1000	1250	1500	1750	2000	2250
51	00	255	510	765	1020	1275	1530	1785	2040	2295
52	00	260	520	780	1040	1300	1560	1820	2080	2340
53	00	265	530	795	1060	1325	1590	1855	2120	2385
54	00	270	540	810	1080	1350	1620	1890	2160	2430
55	00	275	550	825	1100	1375	1650	1925	2200	2475
56	00	280	560	840	1120	1400	1680	1960	2240	2520
57	00	285	570	855	1140	1425	1710	1995	2280	2565
58	00	290	580	870	1160	1450	1740	2030	2320	2610
59	00	295	590	885	1180	1475	1770	2065	2360	2655
60	00	300	600	900	1200	1500	1800	2100	2400	2700

TABLE A (continued)

 $N = 20 \text{ to } 60$ Coefficient of Correlation  $r$  $r = .76 \text{ to } 1.00$ 

$N$	.76	.78	.80	.82	.84	.86	.88	.90	.92	.94	.96	.98	1.00	$N$
20	.0637	.0591	.0543	.0494	.0444	.0393	.0340	.0287	.0232	.0176	.0118	.0060	.0000	20
21	.0622	.0576	.0530	.0482	.0433	.0383	.0332	.0280	.0226	.0171	.0115	.0058	.0000	21
22	.0607	.0563	.0518	.0471	.0423	.0374	.0324	.0273	.0221	.0167	.0113	.0057	.0000	22
23	.0594	.0551	.0506	.0461	.0414	.0366	.0317	.0267	.0216	.0164	.0110	.0056	.0000	23
24	.0582	.0539	.0496	.0451	.0405+	.0359	.0311	.0262	.0211	.0160	.0108	.0055	.0000	24
25	.0570	.0528	.0486	.0442	.0397	.0351	.0304	.0256	.0207	.0157	.0106	.0053	.0000	25
26	.0559	.0518	.0476	.0433	.0389	.0344	.0298	.0251	.0203	.0154	.0104	.0052	.0000	26
27	.0548	.0508	.0467	.0425+	.0382	.0338	.0293	.0247	.0199	.0151	.0102	.0051	.0000	27
28	.0538	.0499	.0459	.0418	.0375+	.0332	.0288	.0242	.0196	.0148	.0100	.0050+	.0000	28
29	.0529	.0490	.0451	.0410	.0369	.0326	.0283	.0238	.0192	.0146	.0098	.0050	.0000	29
30	.0520	.0482	.0443	.0403	.0363	.0321	.0278	.0234	.0189	.0143	.0097	.0049	.0000	30
31	.0512	.0474	.0436	.0397	.0357	.0315+	.0273	.0230	.0186	.0141	.0095	.0048	.0000	31
32	.0504	.0467	.0429	.0391	.0351	.0310	.0269	.0227	.0183	.0139	.0093	.0047	.0000	32
33	.0496	.0460	.0423	.0385	.0346	.0306	.0265	.0223	.0180	.0137	.0092	.0046	.0000	33
34	.0489	.0453	.0416	.0379	.0341	.0301	.0261	.0220	.0178	.0135	.0091	.0046	.0000	34
35	.0482	.0446	.0410	.0373	.0336	.0297	.0257	.0217	.0175+	.0133	.0089	.0045+	.0000	35
36	.0475	.0440	.0405	.0368	.0331	.0293	.0254	.0214	.0173	.0131	.0088	.0045	.0000	36
37	.0468	.0434	.0399	.0363	.0326	.0289	.0250+	.0211	.0170	.0129	.0087	.0044	.0000	37
38	.0462	.0428	.0394	.0358	.0322	.0285	.0247	.0208	.0168	.0127	.0086	.0043	.0000	38
39	.0456	.0423	.0389	.0354	.0318	.0281	.0244	.0205+	.0166	.0126	.0085	.0043	.0000	39
40	.0450+	.0418	.0384	.0349	.0314	.0278	.0241	.0203	.0164	.0124	.0084	.0042	.0000	40
41	.0445	.0413	.0379	.0345+	.0310	.0274	.0238	.0200	.0162	.0123	.0083	.0042	.0000	41
42	.0440	.0408	.0375	.0341	.0306	.0271	.0235	.0198	.0160	.0121	.0082	.0041	.0000	42
43	.0434	.0403	.0370	.0337	.0303	.0268	.0232	.0195+	.0158	.0120	.0081	.0041	.0000	43
44	.0430	.0398	.0366	.0333	.0299	.0265	.0229	.0193	.0156	.0118	.0080	.0040	.0000	44
45	.0425	.0394	.0362	.0329	.0296	.0262	.0227	.0191	.0154	.0117	.0079	.0040	.0000	45
46	.0420	.0389	.0358	.0326	.0293	.0259	.0224	.0189	.0153	.0116	.0078	.0039	.0000	46
47	.0416	.0385+	.0354	.0322	.0290	.0256	.0222	.0187	.0151	.0115	.0077	.0039	.0000	47
48	.0411	.0381	.0350+	.0319	.0287	.0254	.0220	.0185	.0150	.0113	.0076	.0039	.0000	48
49	.0407	.0377	.0347	.0316	.0284	.0251	.0217	.0183	.0148	.0112	.0076	.0038	.0000	49
50	.0403	.0374	.0343	.0312	.0281	.0248	.0215+	.0181	.0147	.0111	.0075	.0038	.0000	50
51	.0399	.0370	.0340	.0309	.0278	.0246	.0213	.0179	.0145+	.0110	.0074	.0037	.0000	51
52	.0395+	.0366	.0337	.0306	.0275+	.0244	.0211	.0178	.0144	.0109	.0073	.0037	.0000	52
53	.0391	.0363	.0334	.0304	.0273	.0241	.0209	.0176	.0142	.0108	.0073	.0037	.0000	53
54	.0388	.0359	.0330	.0301	.0270	.0239	.0207	.0174	.0141	.0107	.0072	.0036	.0000	54
55	.0384	.0356	.0327	.0298	.0268	.0237	.0205+	.0173	.0140	.0106	.0071	.0036	.0000	55
56	.0381	.0353	.0324	.0295+	.0265+	.0235	.0203	.0171	.0138	.0105	.0071	.0036	.0000	56
57	.0377	.0350	.0322	.0293	.0263	.0233	.0202	.0170	.0137	.0104	.0070	.0035+	.0000	57
58	.0374	.0347	.0319	.0290	.0261	.0231	.0200	.0168	.0136	.0103	.0069	.0035+	.0000	58
59	.0371	.0344	.0316	.0288	.0259	.0229	.0198	.0167	.0135	.0102	.0069	.0035	.0000	59
60	.0368	.0341	.0313	.0285+	.0256	.0227	.0196	.0165+	.0134	.0101	.0068	.0034	.0000	60

## PROPORTIONAL PARTS TO ENTRIES, page 13

Correction  $\Delta p$  = Proportional Part of  $r\Delta p$  only.(This is to be *subtracted* after adjustment of decimal place)Proportional Parts of  $r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450

TABLE A. (continued)

 $N = 60$  to  $100$ Coefficient of Correlation  $r$  $r = .00$  to  $.26$ 

$N$	$.00$	$.02$	$.04$	$.06$	$.08$	$.10$	$.12$	$.14$	$.16$	$.18$	$.20$	$.22$	$.24$	$.26$	$N$
60	.0871	.0870	.0869	.0868	.0865 <sup>+</sup>	.0862	.0858	.0854	.0848	.0843	.0836	.0829	.0821	.0812	60
61	.0864	.0863	.0862	.0860	.0858	.0855 <sup>-</sup>	.0851	.0847	.0841	.0836	.0829	.0822	.0814	.0806 <sup>+</sup>	61
62	.0857	.0856	.0855 <sup>+</sup>	.0854	.0851	.0848	.0844	.0840	.0835 <sup>-</sup>	.0829	.0822	.0815 <sup>+</sup>	.0807	.0799	62
63	.0850	.0849	.0848	.0847	.0844	.0841	.0838	.0833	.0828	.0822	.0816	.0809	.0801	.0792	63
64	.0843	.0843	.0842	.0840	.0838	.0835 <sup>-</sup>	.0831	.0827	.0822	.0816	.0809	.0802	.0795 <sup>-</sup>	.0786	64
65	.0837	.0836	.0835 <sup>+</sup>	.0834	.0831	.0828	.0825 <sup>-</sup>	.0820	.0815 <sup>+</sup>	.0809	.0803	.0796	.0788	.0780	65
66	.0830	.0830	.0829	.0827	.0825 <sup>-</sup>	.0822	.0818	.0814	.0809	.0803	.0797	.0790	.0782	.0774	66
67	.0824	.0824	.0823	.0821	.0819	.0816	.0812	.0808	.0803	.0797	.0791	.0784	.0777	.0768	67
68	.0818	.0818	.0817	.0815 <sup>-</sup>	.0813	.0810	.0806	.0802	.0797	.0791	.0785 <sup>+</sup>	.0778	.0771	.0763	68
69	.0812	.0812	.0811	.0809	.0807	.0804	.0800	.0796	.0791	.0786	.0780	.0773	.0765 <sup>+</sup>	.0757	69
70	.0806	.0806	.0805 <sup>-</sup>	.0803	.0801	.0798	.0795 <sup>-</sup>	.0790	.0786	.0780	.0774	.0767	.0760	.0752	70
71	.0800	.0800	.0799	.0798	.0796 <sup>+</sup>	.0792	.0789	.0785 <sup>-</sup>	.0780	.0775 <sup>-</sup>	.0768	.0762	.0754	.0746	71
72	.0795 <sup>-</sup>	.0795 <sup>-</sup>	.0794	.0792	.0790	.0787	.0783	.0779	.0775 <sup>-</sup>	.0769	.0763	.0756	.0749	.0741	72
73	.0789	.0789	.0788	.0787	.0784	.0782	.0778	.0774	.0769	.0764	.0758	.0751	.0744	.0736	73
74	.0784	.0784	.0783	.0781	.0779	.0776	.0773	.0769	.0764	.0759	.0753	.0746	.0739	.0731	74
75	.0779	.0779	.0778	.0776	.0774	.0771	.0768	.0764	.0759	.0754	.0748	.0741	.0734	.0726	75
76	.0774	.0773	.0772	.0771	.0769	.0766	.0763	.0759	.0754	.0749	.0743	.0736	.0729	.0721	76
77	.0769	.0768	.0767	.0766	.0764	.0761	.0758	.0754	.0749	.0744	.0738	.0731	.0724	.0717	77
78	.0764	.0763	.0762	.0761	.0759	.0756	.0753	.0749	.0744	.0739	.0733	.0727	.0720	.0712	78
79	.0759	.0759	.0758	.0756	.0754	.0751	.0748	.0744	.0739	.0734	.0729	.0722	.0715 <sup>+</sup>	.0708	79
80	.0754	.0754	.0753	.0751	.0749	.0747	.0743	.0739	.0735 <sup>-</sup>	.0730	.0724	.0718	.0711	.0703	80
81	.0749	.0749	.0748	.0747	.0745 <sup>-</sup>	.0742	.0739	.0735 <sup>-</sup>	.0730	.0725 <sup>+</sup>	.0719	.0713	.0706	.0699	81
82	.0745 <sup>-</sup>	.0745 <sup>-</sup>	.0744	.0742	.0740	.0737	.0734	.0730	.0726	.0721	.0715 <sup>+</sup>	.0709	.0702	.0694	82
83	.0740	.0740	.0739	.0738	.0736	.0733	.0730	.0726	.0721	.0716	.0711	.0705 <sup>-</sup>	.0698	.0690	83
84	.0736	.0736	.0735 <sup>-</sup>	.0733	.0731	.0729	.0725 <sup>+</sup>	.0722	.0717	.0712	.0706	.0700	.0694	.0686	84
85	.0732	.0731	.0730	.0729	.0727	.0724	.0721	.0717	.0713	.0708	.0702	.0696	.0689	.0682	85
86	.0727	.0727	.0726	.0725 <sup>-</sup>	.0723	.0720	.0717	.0713	.0709	.0704	.0698	.0692	.0685 <sup>+</sup>	.0678	86
87	.0723	.0723	.0722	.0721	.0719	.0716	.0713	.0709	.0705 <sup>-</sup>	.0700	.0694	.0688	.0681	.0674	87
88	.0719	.0719	.0718	.0716	.0714	.0712	.0709	.0705 <sup>-</sup>	.0701	.0696	.0690	.0684	.0678	.0670	88
89	.0715 <sup>-</sup>	.0715 <sup>-</sup>	.0714	.0712	.0710	.0708	.0705 <sup>-</sup>	.0701	.0697	.0692	.0686	.0680	.0674	.0667	89
90	.0711	.0711	.0710	.0708	.0706	.0704	.0701	.0697	.0693	.0688	.0683	.0677	.0670	.0663	90
91	.0707	.0707	.0706	.0705 <sup>-</sup>	.0703	.0700	.0697	.0693	.0689	.0684	.0679	.0673	.0666	.0659	91
92	.0703	.0703	.0702	.0701	.0699	.0696	.0693	.0689	.0685 <sup>+</sup>	.0680	.0675 <sup>+</sup>	.0669	.0663	.0656	92
93	.0699	.0699	.0698	.0697	.0695 <sup>-</sup>	.0692	.0689	.0686	.0682	.0677	.0671	.0666	.0659	.0652	93
94	.0696	.0695 <sup>+</sup>	.0695 <sup>-</sup>	.0693	.0691	.0689	.0686	.0682	.0678	.0673	.0668	.0662	.0656	.0649	94
95	.0692	.0692	.0691	.0690	.0688	.0685 <sup>+</sup>	.0682	.0678	.0674	.0670	.0664	.0659	.0652	.0645 <sup>+</sup>	95
96	.0688	.0688	.0687	.0686	.0684	.0682	.0678	.0675 <sup>-</sup>	.0671	.0666	.0661	.0655 <sup>+</sup>	.0649	.0642	96
97	.0685 <sup>-</sup>	.0685 <sup>-</sup>	.0684	.0682	.0680	.0678	.0675 <sup>-</sup>	.0671	.0667	.0663	.0657	.0652	.0645 <sup>+</sup>	.0639	97
98	.0681	.0681	.0680	.0679	.0677	.0675 <sup>-</sup>	.0672	.0668	.0664	.0659	.0654	.0648	.0642	.0635 <sup>+</sup>	98
99	.0678	.0678	.0677	.0675 <sup>+</sup>	.0674	.0671	.0668	.0665 <sup>-</sup>	.0661	.0656	.0651	.0645 <sup>+</sup>	.0639	.0632	99
100	.0674	.0674	.0673	.0672	.0670	.0668	.0665 <sup>-</sup>	.0661	.0657	.0653	.0648	.0642	.0636	.0629	100



## PROPORTIONAL PARTS TO ENTRIES, page 15

Correction  $\Delta p$  = Proportional Part of  $r\Delta p$  only.

(This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  $r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$r\Delta p$	0	1	2	3	4	5	6	7	8	9
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450
11	00	55	110	165	220	275	330	385	440	495
12	00	60	120	180	240	300	360	420	480	540
13	00	65	130	195	260	325	390	455	520	585
14	00	70	140	210	280	350	420	490	560	630
15	00	75	150	225	300	375	450	525	600	675
16	00	80	160	240	320	400	480	560	640	720
17	00	85	170	255	340	425	510	595	680	765
18	00	90	180	270	360	450	540	630	720	810

TABLE A (continued)

 $N = 60$  to  $100$ Coefficient of Correlation  $r$  $r = .26$  to  $.52$ 

$N$	$.26$	$.28$	$.30$	$.32$	$.34$	$.36$	$.38$	$.40$	$.42$	$.44$	$.46$	$.48$	$.50$	$.52$	$N$
60	.0812	.0802	.0792	.0782	.0770	.0758	.0745 <sup>+</sup>	.0731	.0717	.0702	.0687	.0670	.0653	.0635 <sup>+</sup>	60
61	.0805 <sup>+</sup>	.0796	.0786	.0775 <sup>+</sup>	.0764	.0752	.0739	.0725 <sup>+</sup>	.0711	.0696	.0681	.0665 <sup>-</sup>	.0648	.0630	61
62	.0799	.0789	.0780	.0769	.0756	.0746	.0733	.0720	.0705 <sup>+</sup>	.0691	.0675 <sup>+</sup>	.0659	.0642	.0625 <sup>-</sup>	62
63	.0792	.0783	.0773	.0763	.0752	.0740	.0727	.0714	.0700	.0685 <sup>+</sup>	.0670	.0654	.0637	.0620	63
64	.0786	.0777	.0767	.0757	.0746	.0734	.0721	.0708	.0694	.0680	.0665 <sup>-</sup>	.0649	.0632	.0615 <sup>+</sup>	64
65	.0780	.0771	.0761	.0751	.0740	.0728	.0716	.0703	.0689	.0675 <sup>-</sup>	.0660	.0644	.0627	.0610	65
66	.0774	.0765 <sup>+</sup>	.0756	.0745 <sup>+</sup>	.0734	.0723	.0710	.0697	.0684	.0670	.0655 <sup>-</sup>	.0639	.0623	.0606	66
67	.0768	.0759	.0750	.0740	.0729	.0717	.0705 <sup>+</sup>	.0692	.0679	.0664	.0650 <sup>-</sup>	.0634	.0618	.0601	67
68	.0763	.0754	.0744	.0734	.0723	.0712	.0700	.0687	.0674	.0660	.0645 <sup>-</sup>	.0629	.0613	.0597	68
69	.0757	.0748	.0739	.0729	.0718	.0707	.0695 <sup>-</sup>	.0682	.0669	.0655 <sup>-</sup>	.0640	.0625 <sup>-</sup>	.0609	.0592	69
70	.0752	.0743	.0734	.0724	.0713	.0702	.0690	.0677	.0664	.0650 <sup>+</sup>	.0636	.0620	.0603 <sup>-</sup>	.0588	70
71	.0746	.0738	.0728	.0719	.0708	.0697	.0685 <sup>-</sup>	.0672	.0659	.0646	.0631	.0616	.0600	.0584	71
72	.0741	.0733	.0723	.0713	.0703	.0692	.0680	.0668	.0655 <sup>-</sup>	.0641	.0627	.0612	.0596	.0580	72
73	.0736	.0728	.0718	.0709	.0698	.0687	.0675 <sup>+</sup>	.0663	.0650 <sup>+</sup>	.0637	.0622	.0608	.0592	.0576	73
74	.0731	.0723	.0714	.0704	.0693	.0682	.0671	.0659	.0646	.0632	.0618	.0603	.0588	.0572	74
75	.0726	.0718	.0709	.0699	.0689	.0678	.0666	.0654	.0641	.0628	.0614	.0599	.0584	.0568	75
76	.0721	.0713	.0704	.0694	.0684	.0673	.0662	.0650 <sup>-</sup>	.0637	.0624	.0610	.0595 <sup>+</sup>	.0580	.0564	76
77	.0717	.0708	.0699	.0690	.0680	.0669	.0658	.0646	.0633	.0620	.0606	.0592	.0576	.0561	77
78	.0712	.0704	.0695 <sup>-</sup>	.0686	.0675 <sup>+</sup>	.0665 <sup>-</sup>	.0653	.0642	.0629	.0616	.0602	.0588	.0573	.0557	78
79	.0708	.0699	.0691	.0681	.0671	.0661	.0649	.0637	.0625 <sup>-</sup>	.0612	.0598	.0584	.0569	.0554	79
80	.0703	.0695 <sup>-</sup>	.0686	.0677	.0667	.0656	.0645 <sup>+</sup>	.0633	.0621	.0608	.0595 <sup>-</sup>	.0580	.0566	.0550 <sup>+</sup>	80
81	.0699	.0691	.0682	.0673	.0663	.0652	.0641	.0630	.0617	.0604	.0591	.0577	.0562	.0547	81
82	.0694	.0686	.0678	.0669	.0659	.0648	.0637	.0626	.0613	.0601	.0587	.0573	.0559	.0543	82
83	.0690	.0682	.0674	.0665 <sup>-</sup>	.0655 <sup>-</sup>	.0644	.0633	.0622	.0610	.0597	.0584	.0570	.0555 <sup>+</sup>	.0540	83
84	.0686	.0678	.0670	.0661	.0651	.0641	.0630	.0618	.0606	.0593	.0580	.0566	.0552	.0537	84
85	.0682	.0674	.0666	.0657	.0647	.0637	.0626	.0615 <sup>-</sup>	.0603	.0590	.0577	.0563	.0549	.0534	85
86	.0678	.0670	.0662	.0653	.0643	.0633	.0622	.0611	.0599	.0587	.0573	.0560	.0545 <sup>+</sup>	.0531	86
87	.0674	.0666	.0658	.0649	.0640	.0629	.0619	.0607	.0596	.0583	.0570	.0557	.0542	.0528	87
88	.0670	.0663	.0654	.0645 <sup>+</sup>	.0636	.0626	.0615 <sup>+</sup>	.0604	.0592	.0580	.0567	.0553	.0539	.0525 <sup>-</sup>	88
89	.0667	.0659	.0651	.0642	.0632	.0622	.0612	.0601	.0589	.0577	.0564	.0550 <sup>+</sup>	.0536	.0522	89
90	.0663	.0655 <sup>+</sup>	.0647	.0638	.0629	.0619	.0608	.0597	.0586	.0573	.0561	.0547	.0533	.0519	90
91	.0659	.0652	.0643	.0635 <sup>-</sup>	.0625 <sup>+</sup>	.0615 <sup>+</sup>	.0605 <sup>-</sup>	.0594	.0582	.0570	.0557	.0544	.0530	.0516	91
92	.0656	.0648	.0640	.0631	.0622	.0612	.0602	.0591	.0579	.0567	.0554	.0541	.0527	.0513	92
93	.0652	.0645 <sup>-</sup>	.0636	.0628	.0619	.0609	.0598	.0588	.0576	.0564	.0551	.0538	.0525 <sup>-</sup>	.0510	93
94	.0649	.0641	.0633	.0624	.0615 <sup>+</sup>	.0606	.0595 <sup>+</sup>	.0584	.0573	.0561	.0548	.0535 <sup>+</sup>	.0522	.0508	94
95	.0645 <sup>+</sup>	.0638	.0630	.0621	.0612	.0602	.0592	.0581	.0570	.0558	.0546	.0533	.0519	.0505	95
96	.0642	.0634	.0626	.0618	.0609	.0599	.0589	.0578	.0567	.0555 <sup>+</sup>	.0543	.0530	.0516	.0502	96
97	.0639	.0631	.0623	.0615 <sup>-</sup>	.0606	.0596	.0586	.0575 <sup>+</sup>	.0564	.0552	.0540	.0527	.0514	.0500 <sup>-</sup>	97
98	.0635 <sup>+</sup>	.0628	.0620	.0612	.0603	.0593	.0583	.0572	.0561	.0549	.0537	.0524	.0511	.0497	98
99	.0632	.0625 <sup>-</sup>	.0617	.0608	.0600	.0590	.0580	.0569	.0558	.0547	.0534	.0522	.0508	.0495 <sup>-</sup>	99
100	.0629	.0622	.0614	.0605 <sup>+</sup>	.0597	.0587	.0577	.0567	.0556	.0544	.0532	.0519	.0506	.0492	100

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS TO ENTRIES, page 17

Correction  $\Delta p$  = Proportional Part of  ${}_r\Delta p$  only.

(This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  ${}_r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

${}_r\Delta p$	0	1	2	3	4	5	6	7	8	9
14	00	70	140	210	280	350	420	490	560	630
15	00	75	150	225	300	375	450	525	600	675
16	00	80	160	240	320	400	480	560	640	720
17	00	85	170	255	340	425	510	595	680	765
18	00	90	180	270	360	450	540	630	720	810
19	00	95	190	285	380	475	570	665	760	855
20	00	100	200	300	400	500	600	700	800	900
21	00	105	210	315	420	525	630	735	840	945
22	00	110	220	330	440	550	660	770	880	990
23	00	115	230	345	460	575	690	805	920	1035
24	00	120	240	360	480	600	720	840	960	1080
25	00	125	250	375	500	625	750	875	1000	1125
26	00	130	260	390	520	650	780	910	1040	1170

TABLE A (continued)

 $N = 60$  to  $100$ Coefficient of Correlation  $r$  $r = .52$  to  $.76$ 

$N$	$.52$	$.54$	$.56$	$.58$	$.60$	$.62$	$.64$	$.66$	$.68$	$.70$	$.72$	$.74$	$.76$	$N$
60	.0635 <sup>+</sup>	.0617	.0598	.0578	.0557	.0536	.0514	.0491	.0468	.0444	.0419	.0394	.0368	60
61	.0630	.0612	.0593	.0573	.0553	.0532	.0510	.0487	.0464	.0440	.0416	.0391	.0365	61
62	.0625	.0607	.0588	.0568	.0548	.0527	.0506	.0483	.0461	.0437	.0413	.0388	.0362	62
63	.0620	.0602	.0583	.0564	.0544	.0523	.0502	.0480	.0457	.0433	.0409	.0384	.0359	63
64	.0615 <sup>+</sup>	.0597	.0579	.0559	.0540	.0519	.0498	.0476	.0453	.0430	.0406	.0381	.0356	64
65	.0610	.0593	.0574	.0555 <sup>+</sup>	.0535 <sup>+</sup>	.0515 <sup>+</sup>	.0494	.0472	.0450	.0427	.0403	.0378	.0353	65
66	.0606	.0588	.0570	.0551	.0531	.0511	.0490	.0469	.0446	.0423	.0400	.0376	.0351	66
67	.0601	.0584	.0566	.0547	.0527	.0507	.0486	.0465 <sup>+</sup>	.0443	.0420	.0397	.0373	.0348	67
68	.0597	.0579	.0561	.0543	.0523	.0504	.0483	.0462	.0440	.0417	.0394	.0370	.0345 <sup>+</sup>	68
69	.0592	.0575 <sup>+</sup>	.0557	.0539	.0520	.0500	.0479	.0458	.0437	.0414	.0391	.0367	.0343	69
70	.0588	.0571	.0553	.0535	.0516	.0496	.0476	.0455 <sup>+</sup>	.0433	.0411	.0388	.0365	.0341	70
71	.0584	.0567	.0549	.0531	.0512	.0493	.0473	.0452	.0430	.0408	.0386	.0362	.0338	71
72	.0580	.0563	.0546	.0527	.0509	.0489	.0469	.0449	.0427	.0405 <sup>+</sup>	.0383	.0360	.0336	72
73	.0576	.0559	.0542	.0524	.0505 <sup>+</sup>	.0486	.0466	.0446	.0424	.0403	.0380	.0357	.0333	73
74	.0572	.0555 <sup>+</sup>	.0538	.0520	.0502	.0483	.0463	.0443	.0422	.0400	.0378	.0355	.0331	74
75	.0568	.0552	.0535	.0517	.0498	.0479	.0460	.0440	.0419	.0397	.0376	.0352	.0329	75
76	.0564	.0548	.0531	.0513	.0495 <sup>+</sup>	.0476	.0457	.0437	.0416	.0395	.0373	.0350 <sup>+</sup>	.0327	76
77	.0561	.0545	.0528	.0510	.0492	.0473	.0454	.0434	.0413	.0392	.0370	.0348	.0325	77
78	.0557	.0541	.0524	.0507	.0489	.0470	.0451	.0431	.0411	.0389	.0368	.0346	.0323	78
79	.0554	.0538	.0521	.0504	.0486	.0467	.0448	.0428	.0408	.0387	.0365 <sup>+</sup>	.0343	.0321	79
80	.0550 <sup>+</sup>	.0534	.0518	.0500	.0483	.0464	.0445 <sup>+</sup>	.0426	.0405 <sup>+</sup>	.0385	.0363	.0341	.0319	80
81	.0547	.0531	.0514	.0497	.0480	.0461	.0442	.0423	.0403	.0382	.0361	.0339	.0317	81
82	.0543	.0528	.0511	.0494	.0477	.0459	.0440	.0420	.0400	.0380	.0359	.0337	.0315	82
83	.0540	.0524	.0508	.0491	.0474	.0456	.0437	.0418	.0398	.0378	.0357	.0335	.0313	83
84	.0537	.0521	.0505 <sup>+</sup>	.0488	.0471	.0453	.0434	.0415 <sup>+</sup>	.0396	.0375 <sup>+</sup>	.0354	.0333	.0311	84
85	.0534	.0518	.0502	.0485 <sup>+</sup>	.0468	.0450 <sup>+</sup>	.0432	.0413	.0393	.0373	.0352	.0331	.0309	85
86	.0531	.0515 <sup>+</sup>	.0499	.0483	.0465 <sup>+</sup>	.0448	.0429	.0410	.0391	.0371	.0350 <sup>+</sup>	.0329	.0307	86
87	.0528	.0512	.0496	.0480	.0463	.0445 <sup>+</sup>	.0427	.0408	.0389	.0369	.0348	.0327	.0305 <sup>+</sup>	87
88	.0525	.0509	.0494	.0477	.0460	.0443	.0425	.0406	.0387	.0367	.0346	.0325 <sup>+</sup>	.0304	88
89	.0522	.0506	.0491	.0474	.0458	.0440	.0422	.0404	.0384	.0365	.0344	.0323	.0302	89
90	.0519	.0504	.0488	.0472	.0455 <sup>+</sup>	.0438	.0420	.0401	.0382	.0363	.0342	.0322	.0300	90
91	.0516	.0501	.0485	.0469	.0453	.0435 <sup>+</sup>	.0417	.0399	.0380	.0361	.0341	.0320	.0299	91
92	.0513	.0498	.0483	.0467	.0450 <sup>+</sup>	.0433	.0415 <sup>+</sup>	.0397	.0378	.0359	.0339	.0318	.0297	92
93	.0510	.0495 <sup>+</sup>	.0480	.0464	.0448	.0431	.0413	.0395	.0376	.0357	.0337	.0316	.0295 <sup>+</sup>	93
94	.0508	.0493	.0478	.0462	.0446 <sup>+</sup>	.0428	.0411	.0393	.0374	.0355	.0335 <sup>+</sup>	.0315	.0294	94
95	.0505	.0490	.0475	.0459	.0443	.0426	.0409	.0391	.0372	.0353	.0333	.0313	.0292	95
96	.0502	.0488	.0473	.0457	.0441	.0424	.0406	.0389	.0370	.0351	.0332	.0311	.0291	96
97	.0500	.0485 <sup>+</sup>	.0470	.0454	.0438	.0422	.0404	.0387	.0368	.0349	.0330	.0310	.0289	97
98	.0497	.0483	.0468	.0452	.0436	.0419	.0402	.0385	.0366	.0347	.0328	.0308	.0288	98
99	.0495	.0480	.0465	.0450	.0434	.0417	.0400	.0383	.0364	.0346	.0326	.0307	.0286	99
100	.0492	.0478	.0463	.0448	.0432	.0415 <sup>+</sup>	.0398	.0381	.0363	.0344	.0325	.0305 <sup>+</sup>	.0285	100

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS TO ENTRIES, page 19

Correction  $\Delta p$  = Proportional Part of  $r\Delta p$  only.(This is to be *subtracted* after adjustment of decimal place)Proportional Parts of  $r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$r\Delta p$	0	1	2	3	4	5	6	7	8	9
20	00	100	200	300	400	500	600	700	800	900
21	00	105	210	315	420	525	630	735	840	945
22	00	110	220	330	440	550	660	770	880	990
23	00	115	230	345	460	575	690	805	920	1035
24	00	120	240	360	480	600	720	840	960	1080
25	00	125	250	375	500	625	750	875	1000	1125
26	00	130	260	390	520	650	780	910	1040	1170
27	00	135	270	405	540	675	810	945	1080	1215
28	00	140	280	420	560	700	840	980	1120	1260
29	00	145	290	435	580	725	870	1015	1160	1305
30	00	150	300	450	600	750	900	1050	1200	1350
31	00	155	310	465	620	775	930	1085	1240	1395
32	00	160	320	480	640	800	960	1120	1280	1440
33	00	165	330	495	660	825	990	1155	1320	1485
34	00	170	340	510	680	850	1020	1190	1360	1530

TABLE A (continued)

 $N = 60 \text{ to } 100$ Coefficient of Correlation  $r$  $r = .76 \text{ to } 1.00$ 

$N$	$.76$	$.78$	$.80$	$.82$	$.84$	$.86$	$.88$	$.90$	$.92$	$.94$	$.96$	$.98$	$1.00$	$N$
60	.0368	.0341	.0313	.0285 <sup>+</sup>	.0256	.0227	.0196	.0165 <sup>+</sup>	.0134	.0101	.0068	.0034	.0000	60
61	.0365 <sup>-</sup>	.0338	.0311	.0283	.0254	.0225 <sup>-</sup>	.0195 <sup>-</sup>	.0164	.0133	.0101	.0068	.0034	.0000	61
62	.0362	.0335 <sup>+</sup>	.0308	.0281	.0252	.0223	.0193	.0163	.0132	.0100	.0067	.0034	.0000	62
63	.0359	.0333	.0306	.0278	.0250 <sup>+</sup>	.0221	.0192	.0161	.0131	.0099	.0067	.0034	.0000	63
64	.0356	.0330	.0304	.0276	.0248	.0220	.0190	.0160	.0130	.0098	.0066	.0033	.0000	64
65	.0353	.0328	.0301	.0274	.0246	.0218	.0189	.0159	.0129	.0097	.0066	.0033	.0000	65
66	.0351	.0325 <sup>+</sup>	.0299	.0272	.0244	.0216	.0187	.0158	.0128	.0097	.0065 <sup>+</sup>	.0033	.0000	66
67	.0348	.0323	.0297	.0270	.0243	.0215 <sup>-</sup>	.0186	.0157	.0127	.0096	.0065 <sup>-</sup>	.0033	.0000	67
68	.0345 <sup>+</sup>	.0320	.0294	.0268	.0241	.0213	.0185 <sup>-</sup>	.0155 <sup>+</sup>	.0126	.0095 <sup>+</sup>	.0064	.0032	.0000	68
69	.0343	.0318	.0292	.0266	.0239	.0211	.0183	.0154	.0125 <sup>-</sup>	.0095 <sup>-</sup>	.0064	.0032	.0000	69
70	.0341	.0316	.0290	.0264	.0237	.0210	.0182	.0153	.0124	.0094	.0063	.0032	.0000	70
71	.0338	.0313	.0288	.0262	.0236	.0208	.0181	.0152	.0123	.0093	.0063	.0032	.0000	71
72	.0336	.0311	.0286	.0260	.0234	.0207	.0179	.0151	.0122	.0093	.0062	.0031	.0000	72
73	.0333	.0309	.0284	.0259	.0232	.0206	.0178	.0150 <sup>-</sup>	.0121	.0092	.0062	.0031	.0000	73
74	.0331	.0307	.0282	.0257	.0231	.0204	.0177	.0149	.0120	.0091	.0061	.0031	.0000	74
75	.0329	.0305 <sup>-</sup>	.0280	.0255 <sup>+</sup>	.0229	.0203	.0176	.0148	.0120	.0091	.0061	.0031	.0000	75
76	.0327	.0303	.0279	.0253	.0228	.0201	.0175 <sup>-</sup>	.0147	.0119	.0090	.0061	.0031	.0000	76
77	.0325 <sup>-</sup>	.0301	.0277	.0252	.0226	.0200	.0173	.0146	.0118	.0089	.0060	.0030	.0000	77
78	.0323	.0299	.0275 <sup>-</sup>	.0250 <sup>+</sup>	.0225 <sup>-</sup>	.0199	.0172	.0145 <sup>+</sup>	.0117	.0089	.0060	.0030	.0000	78
79	.0321	.0297	.0273	.0249	.0223	.0198	.0171	.0144	.0117	.0088	.0059	.0030	.0000	79
80	.0319	.0295 <sup>+</sup>	.0271	.0247	.0222	.0196	.0170	.0143	.0116	.0088	.0059	.0030	.0000	80
81	.0317	.0293	.0270	.0246	.0221	.0195 <sup>+</sup>	.0169	.0142	.0115 <sup>+</sup>	.0087	.0059	.0030	.0000	81
82	.0315 <sup>-</sup>	.0292	.0268	.0244	.0219	.0194	.0168	.0142	.0114	.0087	.0058	.0029	.0000	82
83	.0313	.0290	.0267	.0243	.0218	.0193	.0167	.0141	.0114	.0086	.0058	.0029	.0000	83
84	.0311	.0288	.0265 <sup>-</sup>	.0241	.0217	.0192	.0166	.0140	.0113	.0086	.0058	.0029	.0000	84
85	.0309	.0286	.0263	.0240	.0215 <sup>+</sup>	.0191	.0165 <sup>+</sup>	.0139	.0112	.0085 <sup>+</sup>	.0057	.0029	.0000	85
86	.0307	.0285 <sup>-</sup>	.0262	.0238	.0214	.0189	.0164	.0138	.0112	.0085 <sup>-</sup>	.0057	.0029	.0000	86
87	.0305 <sup>+</sup>	.0283	.0260	.0237	.0213	.0188	.0163	.0137	.0111	.0084	.0057	.0029	.0000	87
88	.0304	.0282	.0259	.0236	.0212	.0187	.0162	.0137	.0110	.0084	.0056	.0028	.0000	88
89	.0302	.0280	.0257	.0234	.0210	.0186	.0161	.0136	.0110	.0083	.0056	.0028	.0000	89
90	.0300	.0278	.0256	.0233	.0209	.0185 <sup>+</sup>	.0160	.0135 <sup>+</sup>	.0109	.0083	.0056	.0028	.0000	90
91	.0299	.0277	.0255 <sup>-</sup>	.0232	.0208	.0184	.0160	.0134	.0109	.0082	.0055 <sup>+</sup>	.0028	.0000	91
92	.0297	.0275 <sup>+</sup>	.0253	.0230	.0207	.0183	.0159	.0134	.0108	.0082	.0055 <sup>+</sup>	.0028	.0000	92
93	.0295 <sup>+</sup>	.0274	.0252	.0229	.0206	.0182	.0158	.0133	.0107	.0081	.0055 <sup>-</sup>	.0028	.0000	93
94	.0294	.0272	.0250 <sup>+</sup>	.0228	.0205	.0181	.0157	.0132	.0107	.0081	.0055 <sup>-</sup>	.0028	.0000	94
95	.0292	.0271	.0249	.0227	.0204	.0180	.0156	.0131	.0106	.0081	.0054	.0027	.0000	95
96	.0291	.0270	.0248	.0226	.0203	.0179	.0155 <sup>+</sup>	.0131	.0106	.0080	.0054	.0027	.0000	96
97	.0289	.0268	.0247	.0224	.0202	.0178	.0155 <sup>-</sup>	.0130	.0105 <sup>+</sup>	.0080	.0054	.0027	.0000	97
98	.0288	.0267	.0245 <sup>+</sup>	.0223	.0201	.0177	.0154	.0129	.0105 <sup>-</sup>	.0079	.0053	.0027	.0000	98
99	.0286	.0265 <sup>+</sup>	.0244	.0222	.0200	.0177	.0153	.0129	.0104	.0079	.0053	.0027	.0000	99
100	.0285 <sup>-</sup>	.0264	.0243	.0221	.0199	.0176	.0152	.0128	.0104	.0079	.0053	.0027	.0000	100

## PROPORTIONAL PARTS TO ENTRIES, page 21

Correction  $\Delta p$  = Proportional Part of  ${}_N\Delta p$  + Proportional Part of  ${}_r\Delta p$ .  
 (This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  ${}_N\Delta p$  for  $\delta N$ , if  $N$  = size of population.

${}_N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18
3	03	06	09	12	15	18	21	24	27
4	04	08	12	16	20	24	28	32	36
5	05	10	15	20	25	30	35	40	45
6	06	12	18	24	30	36	42	48	54
7	07	14	21	28	35	42	49	56	63
8	08	16	24	32	40	48	56	64	72
9	09	18	27	36	45	54	63	72	81
10	10	20	30	40	50	60	70	80	90
11	11	22	33	44	55	66	77	88	99
12	12	24	36	48	60	72	84	96	108
13	13	26	39	52	65	78	91	104	117
14	14	28	42	56	70	84	98	112	126
15	15	30	45	60	75	90	105	120	135
16	16	32	48	64	80	96	112	128	144
17	17	34	51	68	85	102	119	136	153
18	18	36	54	72	90	108	126	144	162
19	19	38	57	76	95	114	133	152	171
20	20	40	60	80	100	120	140	160	180
21	21	42	63	84	105	126	147	168	189
22	22	44	66	88	110	132	154	176	198
23	23	46	69	92	115	138	161	184	207
24	24	48	72	96	120	144	168	192	216
25	25	50	75	100	125	150	175	200	225
26	26	52	78	104	130	156	182	208	234
27	27	54	81	108	135	162	189	216	243
28	28	56	84	112	140	168	196	224	252
29	29	58	87	116	145	174	203	232	261
30	30	60	90	120	150	180	210	240	270
31	31	62	93	124	155	186	217	248	279

Proportional Parts of  ${}_r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

${}_r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360



THE COEFFICIENT OF CORRELATION

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TABLE B. Values of  $N = 100$  to  $1000$

$N = 100$  to  $550$

Coefficient of Correlation  $r$

$r = .00$  to  $.26$

$N$	$.00$	$.02$	$.04$	$.06$	$.08$	$.10$	$.12$	$.14$	$.16$	$.18$	$.20$	$.22$	$.24$	$.26$	$N$
100	.0674	.0674	.0673	.0672	.0670	.0668	.0665	.0661	.0657	.0653	.0648	.0642	.0636	.0629	100
110	.0643	.0643	.0642	.0641	.0639	.0637	.0634	.0630	.0627	.0622	.0617	.0612	.0606	.0600	110
120	.0616	.0615	.0615	.0614	.0612	.0610	.0607	.0604	.0600	.0596	.0591	.0586	.0580	.0574	120
130	.0592	.0591	.0591	.0589	.0588	.0586	.0583	.0580	.0576	.0572	.0568	.0563	.0557	.0552	130
140	.0570	.0570	.0569	.0568	.0566	.0564	.0562	.0559	.0555	.0552	.0547	.0542	.0537	.0532	140
150	.0551	.0550	.0550	.0549	.0547	.0545	.0543	.0540	.0537	.0533	.0529	.0524	.0519	.0513	150
160	.0533	.0533	.0532	.0531	.0530	.0528	.0526	.0523	.0520	.0516	.0512	.0507	.0503	.0497	160
170	.0517	.0517	.0516	.0515	.0514	.0512	.0510	.0507	.0504	.0501	.0497	.0492	.0488	.0482	170
180	.0503	.0503	.0502	.0501	.0500	.0498	.0495	.0493	.0490	.0486	.0483	.0478	.0474	.0469	180
190	.0489	.0489	.0489	.0488	.0486	.0484	.0482	.0480	.0477	.0473	.0470	.0466	.0461	.0456	190
200	.0477	.0477	.0476	.0475	.0474	.0472	.0470	.0468	.0465	.0461	.0458	.0454	.0449	.0445	200
210	.0465	.0465	.0465	.0464	.0462	.0461	.0459	.0456	.0454	.0450	.0447	.0443	.0439	.0434	210
220	.0455	.0455	.0454	.0453	.0452	.0450	.0448	.0446	.0443	.0440	.0437	.0433	.0429	.0424	220
230	.0445	.0445	.0444	.0443	.0442	.0440	.0438	.0436	.0433	.0430	.0427	.0423	.0419	.0415	230
240	.0435	.0435	.0435	.0434	.0433	.0431	.0429	.0427	.0424	.0421	.0418	.0414	.0410	.0406	240
250	.0427	.0426	.0426	.0425	.0424	.0422	.0420	.0418	.0416	.0413	.0410	.0406	.0402	.0398	250
260	.0418	.0418	.0418	.0417	.0416	.0414	.0412	.0410	.0408	.0405	.0402	.0398	.0394	.0390	260
270	.0410	.0410	.0410	.0409	.0408	.0406	.0405	.0402	.0400	.0397	.0394	.0391	.0387	.0383	270
280	.0403	.0403	.0402	.0402	.0401	.0399	.0397	.0395	.0393	.0390	.0387	.0384	.0380	.0376	280
290	.0396	.0396	.0395	.0395	.0394	.0392	.0390	.0388	.0386	.0383	.0380	.0377	.0373	.0369	290
300	.0388	.0388	.0388	.0388	.0387	.0386	.0384	.0382	.0379	.0377	.0374	.0371	.0367	.0363	300
310	.0383	.0383	.0382	.0382	.0381	.0379	.0378	.0376	.0373	.0371	.0368	.0365	.0361	.0357	310
320	.0377	.0377	.0376	.0376	.0375	.0373	.0372	.0370	.0367	.0365	.0362	.0359	.0355	.0352	320
330	.0371	.0371	.0371	.0370	.0369	.0368	.0366	.0364	.0362	.0359	.0356	.0353	.0350	.0346	330
340	.0366	.0366	.0365	.0364	.0363	.0362	.0361	.0359	.0356	.0354	.0351	.0348	.0345	.0341	340
350	.0361	.0360	.0360	.0359	.0358	.0357	.0355	.0353	.0351	.0349	.0346	.0343	.0340	.0336	350
360	.0355	.0355	.0355	.0354	.0353	.0352	.0350	.0349	.0346	.0344	.0341	.0338	.0335	.0331	360
370	.0351	.0351	.0350	.0349	.0348	.0347	.0346	.0344	.0342	.0339	.0337	.0334	.0330	.0327	370
380	.0346	.0346	.0345	.0345	.0344	.0343	.0341	.0339	.0337	.0335	.0332	.0329	.0326	.0323	380
390	.0342	.0341	.0341	.0340	.0339	.0338	.0337	.0335	.0333	.0330	.0328	.0325	.0322	.0318	390
400	.0337	.0337	.0337	.0336	.0335	.0334	.0332	.0331	.0329	.0326	.0324	.0321	.0318	.0314	400
410	.0333	.0333	.0333	.0332	.0331	.0330	.0328	.0327	.0325	.0322	.0320	.0317	.0314	.0311	410
420	.0329	.0329	.0329	.0328	.0327	.0326	.0324	.0323	.0321	.0318	.0316	.0313	.0310	.0307	420
430	.0325	.0325	.0325	.0324	.0323	.0322	.0321	.0319	.0317	.0315	.0312	.0310	.0307	.0303	430
440	.0322	.0321	.0321	.0320	.0319	.0318	.0317	.0315	.0313	.0311	.0309	.0306	.0303	.0300	440
450	.0318	.0318	.0317	.0317	.0316	.0315	.0313	.0312	.0310	.0308	.0305	.0303	.0300	.0296	450
460	.0314	.0314	.0314	.0313	.0312	.0311	.0310	.0308	.0306	.0304	.0302	.0299	.0296	.0293	460
470	.0311	.0311	.0311	.0310	.0309	.0308	.0307	.0305	.0303	.0301	.0299	.0296	.0293	.0290	470
480	.0308	.0308	.0307	.0307	.0306	.0305	.0303	.0302	.0300	.0298	.0295	.0293	.0290	.0287	480
490	.0305	.0305	.0304	.0304	.0303	.0302	.0300	.0299	.0297	.0295	.0293	.0290	.0287	.0284	490
500	.0302	.0302	.0301	.0301	.0300	.0299	.0297	.0296	.0294	.0292	.0290	.0287	.0284	.0281	500
510	.0299	.0299	.0298	.0298	.0297	.0296	.0294	.0293	.0291	.0289	.0287	.0284	.0281	.0278	510
520	.0296	.0296	.0295	.0295	.0294	.0293	.0292	.0290	.0288	.0286	.0284	.0281	.0278	.0275	520
530	.0293	.0293	.0293	.0292	.0291	.0290	.0289	.0287	.0285	.0283	.0281	.0278	.0275	.0272	530
540	.0290	.0290	.0289	.0289	.0288	.0287	.0286	.0284	.0282	.0280	.0277	.0275	.0272	.0269	540
550	.0288	.0287	.0287	.0287	.0286	.0285	.0283	.0282	.0280	.0278	.0276	.0273	.0271	.0268	550

## PROPORTIONAL PARTS TO ENTRIES, page 23

Correction  $\Delta p$  = Proportional Part of  ${}_N\Delta p$  + Proportional Part of  ${}_r\Delta p$ .  
 (This is to be subtracted after adjustment of decimal place)

Proportional Parts of  ${}_N\Delta p$  for  $\delta N$ , if  $N$  = size of population.

${}_N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18
3	03	06	09	12	15	18	21	24	27
4	04	08	12	16	20	24	28	32	36
5	05	10	15	20	25	30	35	40	45
6	06	12	18	24	30	36	42	48	54
7	07	14	21	28	35	42	49	56	63
8	08	16	24	32	40	48	56	64	72
9	09	18	27	36	45	54	63	72	81
10	10	20	30	40	50	60	70	80	90
11	11	22	33	44	55	66	77	88	99
12	12	24	36	48	60	72	84	96	108
13	13	26	39	52	65	78	91	104	117
14	14	28	42	56	70	84	98	112	126
15	15	30	45	60	75	90	105	120	135
16	16	32	48	64	80	96	112	128	144
17	17	34	51	68	85	102	119	136	153
18	18	36	54	72	90	108	126	144	162
19	19	38	57	76	95	114	133	152	171
20	20	40	60	80	100	120	140	160	180
21	21	42	63	84	105	126	147	168	189
22	22	44	66	88	110	132	154	176	198
23	23	46	69	92	115	138	161	184	207
24	24	48	72	96	120	144	168	192	216
25	25	50	75	100	125	150	175	200	225
26	26	52	78	104	130	156	182	208	234
27	27	54	81	108	135	162	189	216	243
28	28	56	84	112	140	168	196	224	252
29	29	58	87	116	145	174	203	232	261
30	30	60	90	120	150	180	210	240	270

Proportional Parts of  ${}_r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

${}_r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450
11	00	55	110	165	220	275	330	385	440	495
12	00	60	120	180	240	300	360	420	480	540
13	00	65	130	195	260	325	390	455	520	585
14	00	70	140	210	280	350	420	490	560	630
15	00	75	150	225	300	375	450	525	600	675

TABLE B (continued)

 $N = 100$  to 550(Coefficient of Correlation  $r$ ) $r = .26$  to  $.52$ 

$N$	$.26$	$.28$	$.30$	$.32$	$.34$	$.36$	$.38$	$.40$	$.42$	$.44$	$.46$	$.48$	$.50$	$.52$	$N$
100	.0629	.0622	.0614	.0605 <sup>+</sup>	.0597	.0587	.0577	.0567	.0556	.0544	.0532	.0519	.0506	.0492	100
110	.0600	.0593	.0585 <sup>+</sup>	.0577	.0569	.0560	.0550 <sup>+</sup>	.0540	.0530	.0519	.0507	.0495 <sup>+</sup>	.0482	.0469	110
120	.0574	.0567	.0560	.0553	.0545	.0536	.0527	.0517	.0507	.0497	.0485 <sup>+</sup>	.0474	.0462	.0449	120
130	.0552	.0545 <sup>+</sup>	.0538	.0531	.0523	.0515	.0506	.0497	.0487	.0477	.0466	.0455 <sup>+</sup>	.0444	.0432	130
140	.0532	.0525 <sup>+</sup>	.0519	.0512	.0504	.0496	.0488	.0479	.0469	.0460	.0449	.0439	.0428	.0416	140
150	.0513	.0506	.0501	.0494	.0487	.0479	.0471	.0463	.0454	.0444	.0434	.0424	.0413	.0402	150
160	.0497	.0491	.0485 <sup>+</sup>	.0479	.0472	.0464	.0456	.0448	.0439	.0430	.0420	.0410	.0400	.0389	160
170	.0482	.0477	.0471	.0464	.0458	.0450	.0443	.0435	.0426	.0417	.0408	.0398	.0388	.0377	170
180	.0469	.0463	.0457	.0451	.0445	.0438	.0430	.0422	.0414	.0406 <sup>+</sup>	.0396	.0387	.0377	.0367	180
190	.0456	.0451	.0445 <sup>+</sup>	.0439	.0433	.0426	.0419	.0411	.0403	.0395	.0386	.0377	.0367	.0357	190
200	.0445	.0440	.0434	.0428	.0422	.0415 <sup>+</sup>	.0408	.0401	.0393	.0385 <sup>+</sup>	.0376	.0367	.0358	.0348	200
210	.0434	.0429	.0424	.0418	.0412	.0405 <sup>+</sup>	.0398	.0391	.0383	.0375 <sup>+</sup>	.0367	.0358	.0349	.0340	210
220	.0424	.0419	.0414	.0408	.0402	.0396	.0389	.0382	.0375 <sup>+</sup>	.0367	.0359	.0350 <sup>+</sup>	.0341	.0332	220
230	.0415	.0410	.0405	.0399	.0393	.0387	.0381	.0374	.0366	.0359	.0351	.0342	.0334	.0324	230
240	.0406	.0401	.0396	.0391	.0385 <sup>+</sup>	.0379	.0373	.0366	.0359	.0351	.0343	.0335 <sup>+</sup>	.0327	.0318	240
250	.0398	.0393	.0388	.0383	.0377	.0371	.0365	.0358	.0351	.0344	.0336	.0328	.0320	.0311	250
260	.0390	.0386	.0381	.0375 <sup>+</sup>	.0370	.0364	.0358	.0351	.0345 <sup>+</sup>	.0337	.0330	.0322	.0314	.0305 <sup>+</sup>	260
270	.0383	.0378	.0374	.0368	.0363	.0357	.0351	.0345 <sup>+</sup>	.0338	.0331	.0324	.0316	.0308	.0299	270
280	.0376	.0371	.0367	.0362	.0356	.0351	.0345	.0339	.0332	.0325 <sup>+</sup>	.0318	.0310	.0302	.0294	280
290	.0369	.0365 <sup>+</sup>	.0360	.0356	.0350	.0345	.0339	.0333	.0326	.0319	.0312	.0305	.0297	.0289	290
300	.0363	.0359	.0354	.0350	.0344	.0339	.0333	.0327	.0321	.0314	.0307	.0300	.0292	.0284	300
310	.0357	.0353	.0349	.0344	.0339	.0333	.0328	.0322	.0316	.0309	.0302	.0295 <sup>+</sup>	.0287	.0279	310
320	.0352	.0347	.0343	.0338	.0333	.0328	.0323	.0317	.0311	.0304	.0297	.0290	.0283	.0275 <sup>+</sup>	320
330	.0346	.0342	.0338	.0333	.0328	.0323	.0318	.0312	.0306	.0299	.0293	.0286	.0278	.0271	330
340	.0341	.0337	.0333	.0328	.0324	.0318	.0313	.0307	.0301	.0295 <sup>+</sup>	.0288	.0282	.0274	.0267	340
350	.0336	.0332	.0328	.0324	.0319	.0314	.0308	.0303	.0297	.0291	.0284	.0277	.0270	.0263	350
360	.0331	.0328	.0323	.0319	.0314	.0309	.0304	.0299	.0293	.0287	.0280	.0274	.0267	.0259	360
370	.0327	.0323	.0319	.0315	.0310	.0305 <sup>+</sup>	.0300	.0295 <sup>+</sup>	.0289	.0283	.0276	.0270	.0263	.0256	370
380	.0323	.0319	.0315	.0311	.0306	.0301	.0296	.0291	.0285 <sup>+</sup>	.0279	.0273	.0266	.0260	.0252	380
390	.0318	.0315	.0311	.0307	.0302	.0297	.0292	.0287	.0281	.0275 <sup>+</sup>	.0269	.0263	.0256	.0249	390
400	.0314	.0311	.0307	.0303	.0298	.0294	.0289	.0283	.0278	.0272	.0266	.0260	.0253	.0246	400
410	.0311	.0307	.0303	.0299	.0295	.0290	.0286 <sup>+</sup>	.0280	.0274	.0269	.0263	.0256	.0250 <sup>+</sup>	.0243	410
420	.0307	.0303	.0299	.0295 <sup>+</sup>	.0291	.0286	.0282	.0276	.0271	.0265 <sup>+</sup>	.0259	.0253	.0247	.0240	420
430	.0303	.0300	.0296	.0292	.0288	.0283	.0278	.0273	.0268	.0262	.0256	.0250 <sup>+</sup>	.0244	.0237	430
440	.0300	.0296	.0293	.0289	.0284	.0280	.0275 <sup>+</sup>	.0270	.0265 <sup>+</sup>	.0259	.0254	.0247	.0241	.0235	440
450	.0296	.0293	.0289	.0285 <sup>+</sup>	.0281	.0277	.0272	.0267	.0262	.0256	.0251	.0245 <sup>+</sup>	.0238	.0232	450
460	.0293	.0290	.0286	.0282	.0278	.0274	.0269	.0264	.0259	.0254	.0248	.0242	.0236	.0229	460
470	.0290	.0287	.0283	.0279	.0275 <sup>+</sup>	.0271	.0266	.0261	.0256	.0251	.0245 <sup>+</sup>	.0239	.0233	.0227	470
480	.0287	.0284	.0280	.0276	.0272	.0268	.0263	.0259	.0254	.0248	.0243	.0237	.0231	.0225	480
490	.0284	.0281	.0277	.0274	.0269	.0265 <sup>+</sup>	.0261	.0256	.0251	.0246	.0240	.0234	.0229	.0222	490
500	.0281	.0278	.0274	.0271	.0267	.0263	.0258	.0253	.0248	.0243	.0238	.0232	.0226	.0220	500
510	.0278	.0275 <sup>+</sup>	.0272	.0268	.0264	.0260	.0256	.0251	.0246	.0241	.0235 <sup>+</sup>	.0230	.0224	.0218	510
520	.0276	.0273	.0269	.0265 <sup>+</sup>	.0262	.0257	.0253	.0248	.0244	.0239	.0233	.0228	.0222	.0216	520
530	.0273	.0270	.0267	.0263	.0259	.0255 <sup>+</sup>	.0251	.0246	.0241	.0236	.0231	.0225 <sup>+</sup>	.0220	.0214	530
540	.0271	.0267	.0264	.0261	.0257	.0253	.0248	.0244	.0239	.0234	.0229	.0223	.0218	.0212	540
550	.0268	.0265 <sup>+</sup>	.0262	.0258	.0254	.0250 <sup>+</sup>	.0246	.0242	.0237	.0232	.0227	.0221	.0216	.0210	550

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS TO ENTRIES, page 25

Correction  $\Delta p$  = Proportional Part of  $N\Delta p$  + Proportional Part of  $r\Delta p$ .  
(This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  $N\Delta p$  for  $\delta N$ , if  $N$  = size of population.

$N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18
3	03	06	09	12	15	18	21	24	27
4	04	08	12	16	20	24	28	32	36
5	05	10	15	20	25	30	35	40	45
6	06	12	18	24	30	36	42	48	54
7	07	14	21	28	35	42	49	56	63
8	08	16	24	32	40	48	56	64	72
9	09	18	27	36	45	54	63	72	81
10	10	20	30	40	50	60	70	80	90
11	11	22	33	44	55	66	77	88	99
12	12	24	36	48	60	72	84	96	108
13	13	26	39	52	65	78	91	104	117
14	14	28	42	56	70	84	98	112	126
15	15	30	45	60	75	90	105	120	135
16	16	32	48	64	80	96	112	128	144
17	17	34	51	68	85	102	119	136	153
18	18	36	54	72	90	108	126	144	162
19	19	38	57	76	95	114	133	152	171
20	20	40	60	80	100	120	140	160	180
21	21	42	63	84	105	126	147	168	189
22	22	44	66	88	110	132	154	176	198
23	23	46	69	92	115	138	161	184	207
24	24	48	72	96	120	144	168	192	216

Proportional Parts of  $r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450
11	00	55	110	165	220	275	330	385	440	495
12	00	60	120	180	240	300	360	420	480	540
13	00	65	130	195	260	325	390	455	520	585
14	00	70	140	210	280	350	420	490	560	630
15	00	75	150	225	300	375	450	525	600	675
16	00	80	160	240	320	400	480	560	640	720
17	00	85	170	255	340	425	510	595	680	765
18	00	90	180	270	360	450	540	630	720	810
19	00	95	190	285	380	475	570	665	760	855
20	00	100	200	300	400	500	600	700	800	900

THE COEFFICIENT OF CORRELATION

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TABLE B (continued)

$N = 100$  to  $550$

Coefficient of Correlation  $r$

$r = .52$  to  $.76$

$N$	$.52$	$.54$	$.56$	$.58$	$.60$	$.62$	$.64$	$.66$	$.68$	$.70$	$.72$	$.74$	$.76$	$N$
100	.0492	.0478	.0463	.0448	.0432	.0415 <sup>+</sup>	.0396	.0381	.0363	.0344	.0325 <sup>-</sup>	.0305 <sup>+</sup>	.0285 <sup>-</sup>	100
110	.0469	.0456	.0441	.0427	.0412	.0396	.0380	.0363	.0346	.0328	.0310	.0291	.0272	110
120	.0449	.0438	.0423	.0409	.0394	.0379	.0364	.0348	.0331	.0314	.0297	.0279	.0260	120
130	.0432	.0419	.0406	.0393	.0379	.0364	.0349	.0334	.0318	.0302	.0285	.0268	.0250	130
140	.0416	.0404	.0391	.0378	.0365 <sup>-</sup>	.0351	.0337	.0322	.0306	.0291	.0275	.0258	.0241	140
150	.0402	.0390	.0378	.0365 <sup>+</sup>	.0352	.0339	.0325 <sup>+</sup>	.0311	.0298	.0281	.0265 <sup>+</sup>	.0249	.0233	150
160	.0389	.0378	.0366	.0354	.0341	.0328	.0315 <sup>-</sup>	.0301	.0287	.0272	.0257	.0241	.0225 <sup>+</sup>	160
170	.0377	.0366	.0355 <sup>+</sup>	.0343	.0331	.0318	.0305 <sup>+</sup>	.0292	.0278	.0264	.0249	.0234	.0219	170
180	.0367	.0356	.0345 <sup>+</sup>	.0334	.0322	.0309	.0297	.0284	.0270	.0256	.0242	.0227	.0212	180
190	.0357	.0347	.0336	.0326	.0313	.0301	.0289	.0276	.0263	.0250 <sup>-</sup>	.0236	.0221	.0207	190
200	.0348	.0338	.0327	.0316	.0305 <sup>+</sup>	.0294	.0282	.0269	.0256	.0243	.0230	.0216	.0201	200
210	.0340	.0330	.0319	.0309	.0298	.0287	.0275 <sup>-</sup>	.0263	.0250 <sup>+</sup>	.0237	.0224	.0211	.0197	210
220	.0332	.0322	.0312	.0302	.0291	.0280	.0268	.0257	.0244	.0232	.0219	.0206	.0192	220
230	.0324	.0315 <sup>+</sup>	.0305 <sup>+</sup>	.0295 <sup>+</sup>	.0285 <sup>+</sup>	.0274	.0263	.0251	.0239	.0227	.0214	.0201	.0188	230
240	.0318	.0308	.0299	.0289	.0279	.0268	.0257	.0246	.0234	.0222	.0210	.0197	.0184	240
250	.0311	.0302	.0293	.0283	.0273	.0263	.0252	.0241	.0229	.0218	.0205 <sup>+</sup>	.0193	.0180	250
260	.0305 <sup>+</sup>	.0296	.0287	.0278	.0268	.0258	.0247	.0236	.0225 <sup>-</sup>	.0213	.0201	.0189	.0177	260
270	.0299	.0291	.0282	.0272	.0263	.0253	.0242	.0232	.0221	.0209	.0198	.0186	.0173	270
280	.0294	.0286	.0277	.0267	.0258	.0248	.0238	.0228	.0217	.0206	.0194	.0182	.0170	280
290	.0289	.0281	.0272	.0263	.0253	.0244	.0234	.0224	.0213	.0202	.0191	.0179	.0167	290
300	.0284	.0276	.0267	.0258	.0249	.0240	.0230	.0220	.0209	.0199	.0188	.0176	.0164	300
310	.0279	.0271	.0263	.0254	.0245 <sup>+</sup>	.0236	.0226	.0216	.0206	.0195 <sup>+</sup>	.0184	.0173	.0162	310
320	.0275 <sup>+</sup>	.0267	.0259	.0250 <sup>+</sup>	.0241	.0232	.0223	.0213	.0203	.0192	.0182	.0171	.0159	320
330	.0271	.0263	.0255 <sup>-</sup>	.0246	.0236	.0229	.0219	.0210	.0200	.0189	.0179	.0168	.0157	330
340	.0267	.0259	.0251	.0243	.0234	.0225 <sup>+</sup>	.0216	.0206	.0197	.0187	.0176	.0165 <sup>+</sup>	.0155 <sup>+</sup>	340
350	.0263	.0255 <sup>+</sup>	.0247	.0239	.0231	.0222	.0213	.0203	.0194	.0184	.0174	.0163	.0152	350
360	.0259	.0252	.0244	.0236	.0228	.0219	.0210	.0201	.0191	.0181	.0171	.0161	.0150 <sup>+</sup>	360
370	.0256	.0248	.0241	.0233	.0224	.0216	.0207	.0198	.0189	.0179	.0169	.0159	.0148	370
380	.0252	.0245 <sup>+</sup>	.0237	.0230	.0221	.0213	.0204	.0195 <sup>+</sup>	.0186	.0176	.0167	.0157	.0146	380
390	.0249	.0242	.0234	.0227	.0219	.0210	.0202	.0193	.0184	.0174	.0164	.0155 <sup>-</sup>	.0144	390
400	.0246	.0239	.0231	.0224	.0216	.0208	.0199	.0190	.0181	.0172	.0162	.0153	.0142	400
410	.0243	.0236	.0229	.0221	.0213	.0205 <sup>+</sup>	.0197	.0188	.0179	.0170	.0160	.0151	.0141	410
420	.0240	.0233	.0226	.0218	.0211	.0203	.0194	.0186	.0177	.0168	.0159	.0149	.0139	420
430	.0237	.0230	.0223	.0216	.0208	.0200	.0192	.0184	.0175	.0166	.0157	.0147	.0137	430
440	.0235 <sup>-</sup>	.0228	.0221	.0213	.0206	.0198	.0190	.0181	.0173	.0164	.0155 <sup>+</sup>	.0145 <sup>+</sup>	.0136	440
450	.0232	.0225 <sup>+</sup>	.0218	.0211	.0203	.0196	.0188	.0179	.0171	.0162	.0153	.0144	.0134	450
460	.0229	.0223	.0216	.0209	.0201	.0194	.0186	.0177	.0169	.0160	.0151	.0142	.0133	460
470	.0227	.0220	.0214	.0206	.0198	.0192	.0184	.0176	.0167	.0159	.0150 <sup>-</sup>	.0141	.0131	470
480	.0225 <sup>-</sup>	.0218	.0211	.0204	.0197	.0190	.0182	.0174	.0166	.0157	.0148	.0139	.0130	480
490	.0222	.0216	.0209	.0202	.0195 <sup>+</sup>	.0188	.0180	.0172	.0164	.0155 <sup>+</sup>	.0146	.0138	.0129	490
500	.0220	.0214	.0207	.0200	.0193	.0186	.0178	.0170	.0162	.0154	.0145 <sup>+</sup>	.0136	.0127	500
510	.0218	.0212	.0205 <sup>+</sup>	.0198	.0191	.0184	.0176	.0169	.0161	.0152	.0144	.0135 <sup>-</sup>	.0126	510
520	.0216	.0210	.0203	.0196	.0189	.0182	.0175 <sup>-</sup>	.0167	.0159	.0151	.0142	.0134	.0125	520
530	.0214	.0208	.0201	.0194	.0188	.0180	.0173	.0165 <sup>+</sup>	.0158	.0149	.0141	.0133	.0124	530
540	.0212	.0206	.0199	.0193	.0186	.0179	.0171	.0164	.0156	.0148	.0140	.0131	.0123	540
550	.0210	.0204	.0197	.0191	.0184	.0177	.0170	.0162	.0155 <sup>-</sup>	.0147	.0139	.0130	.0121	550

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS TO ENTRIES, page 27

Correction  $\Delta p$  = Proportional Part of  $N\Delta p$  + Proportional Part of  $r\Delta p$ .  
 (This is to be subtracted after adjustment of decimal place)

Proportional Parts of  $N\Delta p$  for  $\delta N$ , if  $N$  = size of population.

$N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18
3	03	06	09	12	15	18	21	24	27
4	04	08	12	16	20	24	28	32	36
5	05	10	15	20	25	30	35	40	45
6	06	12	18	24	30	36	42	48	54
7	07	14	21	28	35	42	49	56	63
8	08	16	24	32	40	48	56	64	72
9	09	18	27	36	45	54	63	72	81
10	10	20	30	40	50	60	70	80	90
11	11	22	33	44	55	66	77	88	99
12	12	24	36	48	60	72	84	96	108
13	13	26	39	52	65	78	91	104	117
14	14	28	42	56	70	84	98	112	126

Proportional Parts of  $r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

$r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450
11	00	55	110	165	220	275	330	385	440	495
12	00	60	120	180	240	300	360	420	480	540
13	00	65	130	195	260	325	390	455	520	585
14	00	70	140	210	280	350	420	490	560	630
15	00	75	150	225	300	375	450	525	600	675
16	00	80	160	240	320	400	480	560	640	720
17	00	85	170	255	340	425	510	595	680	765
18	00	90	180	270	360	450	540	630	720	810
19	00	95	190	285	380	475	570	665	760	855
20	00	100	200	300	400	500	600	700	800	900
21	00	105	210	315	420	525	630	735	840	945
22	00	110	220	330	440	550	660	770	880	990
23	00	115	230	345	460	575	690	805	920	1035
24	00	120	240	360	480	600	720	840	960	1080
25	00	125	250	375	500	625	750	875	1000	1125
26	00	130	260	390	520	650	780	910	1040	1170
27	00	135	270	405	540	675	810	945	1080	1215
28	00	140	280	420	560	700	840	980	1120	1260

TABLE B (continued)

 $N = 100$  to 550Coefficient of Correlation  $r$  $r = .76$  to 1.00

$N$	.76	.78	.80	.82	.84	.86	.88	.90	.92	.94	.96	.98	1.00	$N$
100	.0285-	.0264	.0243	.0221	.0199	.0176	.0152	.0128	.0104	.0079	.0053	.0027	.0000	100
110	.0272	.0252	.0232	.0211	.0189	.0167	.0145+	.0122	.0099	.0075-	.0050+	.0025+	.0000	110
120	.0260	.0241	.0222	.0202	.0181	.0160	.0139	.0117	.0095-	.0072	.0048	.0024	.0000	120
130	.0250	.0232	.0213	.0194	.0174	.0154	.0133	.0112	.0091	.0069	.0046	.0023	.0000	130
140	.0241	.0223	.0205+	.0187	.0168	.0148	.0129	.0108	.0088	.0066	.0045-	.0023	.0000	140
150	.0233	.0216	.0198	.0180	.0162	.0143	.0124	.0105-	.0085-	.0064	.0043	.0022	.0000	150
160	.0225+	.0209	.0192	.0175-	.0157	.0139	.0120	.0101	.0082	.0062	.0042	.0021	.0000	160
170	.0219	.0203	.0186	.0169	.0152	.0135-	.0117	.0098	.0079	.0060	.0041	.0020	.0000	170
180	.0212	.0197	.0181	.0165-	.0148	.0131	.0113	.0096	.0077	.0059	.0039	.0020	.0000	180
190	.0207	.0192	.0176	.0160	.0144	.0127	.0110	.0093	.0075+	.0057	.0038	.0019	.0000	190
200	.0201	.0187	.0172	.0156	.0140	.0124	.0108	.0091	.0073	.0056	.0037	.0019	.0000	200
210	.0197	.0182	.0168	.0152	.0137	.0121	.0105+	.0088	.0071	.0054	.0036	.0018	.0000	210
220	.0192	.0178	.0164	.0149	.0134	.0118	.0103	.0086	.0070	.0053	.0036	.0018	.0000	220
230	.0188	.0174	.0160	.0146	.0131	.0116	.0100	.0085-	.0069	.0052	.0035-	.0018	.0000	230
240	.0184	.0170	.0157	.0143	.0128	.0113	.0098	.0083	.0067	.0051	.0034	.0017	.0000	240
250	.0180	.0167	.0154	.0140	.0126	.0111	.0096	.0081	.0066	.0050-	.0033	.0017	.0000	250
260	.0177	.0164	.0151	.0137	.0123	.0109	.0094	.0079	.0064	.0049	.0033	.0017	.0000	260
270	.0173	.0161	.0148	.0134	.0121	.0107	.0093	.0078	.0063	.0048	.0032	.0016	.0000	270
280	.0170	.0158	.0145+	.0132	.0119	.0105-	.0091	.0077	.0062	.0047	.0032	.0016	.0000	280
290	.0167	.0155+	.0143	.0130	.0117	.0103	.0089	.0075+	.0061	.0046	.0031	.0016	.0000	290
300	.0164	.0152	.0140	.0128	.0115-	.0101	.0088	.0074	.0060	.0045+	.0031	.0015+	.0000	300
310	.0162	.0150+	.0139	.0125+	.0113	.0100	.0086	.0073	.0059	.0045-	.0030	.0015+	.0000	310
320	.0159	.0148	.0136	.0124	.0111	.0098	.0085+	.0072	.0058	.0044	.0030	.0015-	.0000	320
330	.0157	.0145+	.0134	.0122	.0109	.0097	.0084	.0071	.0057	.0043	.0029	.0015	.0000	330
340	.0155-	.0143	.0132	.0120	.0108	.0095+	.0083	.0070	.0056	.0043	.0029	.0014	.0000	340
350	.0152	.0141	.0130	.0118	.0106	.0094	.0081	.0069	.0055+	.0042	.0028	.0014	.0000	350
360	.0150+	.0139	.0128	.0116	.0105-	.0093	.0080	.0068	.0055-	.0041	.0028	.0014	.0000	360
370	.0148	.0137	.0126	.0115-	.0103	.0091	.0079	.0067	.0054	.0041	.0027	.0014	.0000	370
380	.0146	.0135+	.0125-	.0113	.0102	.0090	.0078	.0066	.0053	.0040	.0027	.0014	.0000	380
390	.0144	.0134	.0123	.0112	.0101	.0089	.0077	.0065-	.0052	.0040	.0027	.0014	.0000	390
400	.0142	.0132	.0121	.0110	.0099	.0088	.0076	.0064	.0052	.0039	.0026	.0013	.0000	400
410	.0141	.0130	.0120	.0109	.0098	.0087	.0075+	.0063	.0051	.0039	.0026	.0013	.0000	410
420	.0139	.0129	.0118	.0108	.0097	.0086	.0074	.0063	.0051	.0038	.0026	.0013	.0000	420
430	.0137	.0127	.0117	.0107	.0096	.0085-	.0073	.0062	.0050	.0038	.0026	.0013	.0000	430
440	.0136	.0126	.0116	.0105+	.0095-	.0084	.0073	.0061	.0049	.0037	.0025+	.0013	.0000	440
450	.0134	.0125-	.0114	.0104	.0094	.0083	.0072	.0060	.0049	.0037	.0025-	.0013	.0000	450
460	.0133	.0123	.0113	.0103	.0093	.0082	.0071	.0060	.0048	.0037	.0025-	.0012	.0000	460
470	.0131	.0122	.0112	.0102	.0092	.0081	.0070	.0059	.0048	.0036	.0024	.0012	.0000	470
480	.0130	.0121	.0111	.0101	.0091	.0080	.0069	.0058	.0047	.0036	.0024	.0012	.0000	480
490	.0129	.0119	.0110	.0100	.0090	.0079	.0069	.0058	.0047	.0035+	.0024	.0012	.0000	490
500	.0127	.0118	.0109	.0099	.0089	.0079	.0068	.0057	.0046	.0035+	.0024	.0012	.0000	500
510	.0126	.0117	.0108	.0098	.0088	.0078	.0067	.0057	.0046	.0035-	.0023	.0012	.0000	510
520	.0125	.0116	.0106	.0097	.0087	.0077	.0067	.0056	.0045+	.0034	.0023	.0012	.0000	520
530	.0124	.0115-	.0105+	.0096	.0086	.0076	.0066	.0056	.0045+	.0034	.0023	.0012	.0000	530
540	.0123	.0114	.0105	.0095+	.0085+	.0076	.0065+	.0055+	.0045-	.0034	.0023	.0011	.0000	540
550	.0121	.0113	.0104	.0094	.0085-	.0075-	.0065-	.0055-	.0044	.0033	.0023	.0011	.0000	550



PROPORTIONAL PARTS TO ENTRIES, page 29

Correction  $\Delta p$  = Proportional Part of  ${}_N\Delta p$  + Proportional Part of  ${}_r\Delta p$ .  
(This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  ${}_N\Delta p$  for  $\delta N$ , if  $N$  = size of population.

${}_N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18
3	03	06	09	12	15	18	21	24	27
4	04	08	12	16	20	24	28	32	36

Proportional Parts of  ${}_r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

${}_r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180

## THE COEFFICIENT OF CORRELATION

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TABLE B (continued)

N = 550 to 1000

Coefficient of Correlation  $r$  $r = .00$  to  $.26$ 

N	.00	.02	.04	.06	.08	.10	.12	.14	.16	.18	.20	.22	.24	.26	N
550	.0288	.0287	.0287	.0287	.0286	.0285	.0283	.0282	.0280	.0278	.0276	.0274	.0271	.0268	550
560	.0285+	.0285	.0285	.0284	.0283	.0282	.0281	.0279	.0278	.0276	.0274	.0271	.0269	.0266	560
570	.0283	.0282	.0282	.0281	.0281	.0280	.0278	.0277	.0275+	.0273	.0271	.0269	.0266	.0263	570
580	.0280	.0280	.0280	.0279	.0278	.0277	.0276	.0275	.0273	.0271	.0269	.0267	.0264	.0261	580
590	.0278	.0278	.0277	.0277	.0276	.0275	.0274	.0272	.0271	.0269	.0267	.0264	.0262	.0259	590
600	.0275+	.0275+	.0275	.0274	.0274	.0273	.0271	.0270	.0268	.0266	.0264	.0262	.0259	.0257	600
610	.0273	.0273	.0273	.0272	.0271	.0270	.0269	.0268	.0266	.0264	.0262	.0260	.0257	.0255	610
620	.0271	.0271	.0270	.0270	.0269	.0268	.0267	.0266	.0264	.0262	.0260	.0258	.0255+	.0253	620
630	.0269	.0269	.0268	.0268	.0267	.0266	.0265	.0263	.0262	.0260	.0258	.0256	.0253	.0251	630
640	.0267	.0267	.0266	.0266	.0265	.0264	.0263	.0261	.0260	.0258	.0256	.0254	.0251	.0249	640
650	.0265	.0264	.0264	.0264	.0263	.0262	.0261	.0259	.0258	.0256	.0254	.0252	.0249	.0247	650
660	.0263	.0262	.0262	.0262	.0261	.0260	.0259	.0257	.0256	.0254	.0252	.0250+	.0247	.0245	660
670	.0261	.0260	.0260	.0260	.0259	.0258	.0257	.0255+	.0254	.0252	.0250+	.0248	.0246	.0243	670
680	.0259	.0258	.0258	.0258	.0257	.0256	.0255	.0254	.0252	.0250+	.0248	.0246	.0244	.0241	680
690	.0257	.0257	.0256	.0256	.0255	.0254	.0253	.0252	.0250	.0248	.0247	.0244	.0242	.0239	690
700	.0255	.0255	.0255	.0254	.0253	.0252	.0251	.0250	.0248	.0247	.0245	.0243	.0240	.0238	700
710	.0253	.0253	.0253	.0252	.0252	.0251	.0249	.0248	.0247	.0245+	.0243	.0241	.0239	.0236	710
720	.0251	.0251	.0251	.0250	.0250	.0249	.0248	.0246	.0245	.0243	.0241	.0239	.0237	.0234	720
730	.0250	.0250	.0249	.0249	.0248	.0247	.0246	.0245	.0243	.0242	.0240	.0238	.0236+	.0233	730
740	.0248	.0248	.0248	.0247	.0246	.0245	.0244	.0243	.0242	.0240	.0238	.0236	.0234	.0231	740
750	.0246	.0246	.0246	.0245	.0245	.0244	.0243	.0241	.0240	.0238	.0236	.0234	.0232	.0230	750
760	.0245	.0245	.0244	.0244	.0243	.0242	.0241	.0240	.0238	.0237	.0235	.0233	.0231	.0228	760
770	.0243	.0243	.0243	.0242	.0242	.0241	.0240	.0238	.0237	.0235	.0233	.0231	.0229	.0227	770
780	.0242	.0241	.0241	.0241	.0240	.0239	.0238	.0237	.0235	.0234	.0232	.0230	.0228	.0225+	780
790	.0240	.0240	.0240	.0239	.0238	.0237	.0236	.0235	.0234	.0232	.0230	.0228	.0226	.0224	790
800	.0238	.0238	.0238	.0238	.0237	.0236	.0235	.0234	.0232	.0231	.0229	.0227	.0225	.0222	800
810	.0237	.0237	.0237	.0236	.0235	.0235	.0234	.0232	.0231	.0229	.0228	.0226	.0223	.0221	810
820	.0236	.0235+	.0235	.0235	.0234	.0233	.0232	.0231	.0230	.0228	.0226	.0224	.0222	.0220	820
830	.0234	.0234	.0234	.0233	.0233	.0232	.0231	.0230	.0228	.0227	.0225	.0223	.0221	.0218	830
840	.0233	.0233	.0233	.0232	.0231	.0230	.0229	.0228	.0227	.0225+	.0223	.0221	.0219	.0217	840
850	.0231	.0231	.0231	.0231	.0230	.0229	.0228	.0227	.0225+	.0224	.0222	.0220	.0218	.0215	850
860	.0230	.0230	.0230	.0229	.0229	.0228	.0227	.0225	.0224	.0223	.0221	.0219	.0217	.0214	860
870	.0229	.0229	.0228	.0228	.0227	.0226	.0225	.0224	.0223	.0222	.0220	.0218	.0216	.0213	870
880	.0227	.0227	.0227	.0227	.0226	.0225	.0224	.0223	.0222	.0220	.0218	.0216	.0214	.0212	880
890	.0226	.0226	.0226	.0225	.0225	.0224	.0223	.0222	.0220	.0219	.0217	.0215+	.0213	.0211	890
900	.0225	.0225	.0224	.0224	.0223	.0223	.0222	.0220	.0219	.0218	.0216	.0214	.0212	.0210	900
910	.0224	.0224	.0223	.0223	.0222	.0221	.0220	.0219	.0218	.0216	.0215	.0213	.0211	.0208	910
920	.0222	.0222	.0222	.0222	.0221	.0220	.0219	.0218	.0217	.0216	.0214	.0212	.0210	.0207	920
930	.0221	.0221	.0221	.0220	.0220	.0219	.0218	.0217	.0216	.0214	.0212	.0210	.0208	.0206	930
940	.0220	.0220	.0219	.0219	.0219	.0218	.0217	.0216	.0214	.0213	.0211	.0209	.0207	.0204	940
950	.0218	.0218	.0218	.0218	.0217	.0217	.0216	.0215	.0214	.0212	.0210	.0208	.0206	.0204	950
960	.0218	.0218	.0217	.0217	.0216	.0216	.0215	.0214	.0212	.0211	.0209	.0207	.0205	.0203	960
970	.0217	.0216	.0216	.0216	.0215	.0214	.0213	.0212	.0211	.0210	.0208	.0206	.0204	.0202	970
980	.0216	.0215	.0215	.0215	.0214	.0214	.0213	.0212	.0211	.0210	.0208	.0207	.0205	.0203	980
990	.0214	.0214	.0214	.0214	.0213	.0213	.0212	.0211	.0210	.0209	.0207	.0206	.0204	.0202	990
1000	.0213	.0213	.0213	.0213	.0212	.0211	.0210	.0209	.0208	.0206	.0205	.0203	.0201	.0199	1000

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS TO ENTRIES, page 31

Correction  $\Delta p =$  Proportional Part of  ${}_N\Delta p +$  Proportional Part of  ${}_r\Delta p$ .  
 (This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  ${}_N\Delta p$  for  $\delta N$ , if  $N =$  size of population.

${}_N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18
3	03	06	09	12	15	18	21	24	27
4	04	08	12	16	20	24	28	32	36

Proportional Parts of  ${}_r\Delta p$  for  $\delta r$ , if  $r =$  coefficient of correlation.

${}_r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270

TABLE B (continued)

 $N = 550$  to  $1000$ Coefficient of Correlation  $r$  $r = .26$  to  $.52$ 

$N$	$.26$	$.28$	$.30$	$.32$	$.34$	$.36$	$.38$	$.40$	$.42$	$.44$	$.46$	$.48$	$.50$	$.52$	$N$
550	.0268	.0265 <sup>+</sup>	.0262	.0258	.0254	.0250 <sup>+</sup>	.0246	.0242	.0237	.0232	.0227	.0221	.0216	.0210	550
560	.0266	.0263	.0259	.0256	.0252	.0248	.0244	.0239	.0235	.0230	.0225	.0219	.0214	.0208	560
570	.0263	.0260	.0257	.0254	.0250	.0246	.0242	.0237	.0233	.0228	.0223	.0217	.0212	.0206	570
580	.0261	.0258	.0255	.0251	.0248	.0244	.0240	.0235 <sup>+</sup>	.0231	.0226	.0221	.0216	.0210	.0204	580
590	.0259	.0256	.0253	.0249	.0246	.0242	.0238	.0233	.0229	.0224	.0219	.0214	.0208	.0203	590
600	.0257	.0254	.0251	.0247	.0244	.0240	.0236	.0231	.0227	.0222	.0217	.0212	.0207	.0201	600
610	.0255	.0252	.0249	.0245 <sup>+</sup>	.0242	.0238	.0234	.0229	.0225	.0220	.0215 <sup>+</sup>	.0210	.0206	.0199	610
620	.0253	.0250	.0247	.0243	.0240	.0236	.0232	.0228	.0223	.0218	.0214	.0208	.0203	.0198	620
630	.0251	.0248	.0245	.0241	.0238	.0234	.0230	.0226	.0221	.0217	.0212	.0207	.0202	.0196	630
640	.0249	.0246	.0243	.0239	.0236	.0232	.0228	.0224	.0220	.0215	.0210	.0205 <sup>+</sup>	.0200	.0195	640
650	.0247	.0244	.0241	.0237	.0234	.0230	.0226	.0222	.0218	.0213	.0209	.0204	.0198	.0193	650
660	.0245	.0242	.0239	.0236	.0232	.0229	.0225	.0221	.0216	.0212	.0207	.0202	.0197	.0192	660
670	.0243	.0240	.0237	.0234	.0230	.0227	.0223	.0219	.0215	.0210	.0205 <sup>+</sup>	.0201	.0195 <sup>+</sup>	.0190	670
680	.0241	.0238	.0235 <sup>+</sup>	.0232	.0229	.0225 <sup>+</sup>	.0221	.0217	.0213	.0208	.0204	.0199	.0194	.0189	680
690	.0239	.0237	.0234	.0230	.0227	.0223	.0220	.0216	.0211	.0207	.0202	.0198	.0193	.0187	690
700	.0238	.0235	.0232	.0229	.0225 <sup>+</sup>	.0222	.0218	.0214	.0210	.0206	.0201	.0196	.0191	.0186	700
710	.0236	.0233	.0230	.0227	.0224	.0220	.0217	.0213	.0208	.0204	.0200	.0195	.0190	.0185	710
720	.0234	.0232	.0229	.0226	.0222	.0219	.0215 <sup>+</sup>	.0211	.0207	.0203	.0198	.0193	.0189	.0183	720
730	.0233	.0230	.0227	.0224	.0221	.0217	.0214	.0210	.0206	.0201	.0197	.0192	.0187	.0182	730
740	.0231	.0229	.0226	.0223	.0219	.0216	.0212	.0208	.0204	.0200	.0195 <sup>+</sup>	.0191	.0186	.0181	740
750	.0230	.0227	.0224	.0221	.0218	.0214	.0211	.0207	.0203	.0199	.0194	.0190	.0185	.0180	750
760	.0228	.0225 <sup>+</sup>	.0223	.0220	.0216	.0213	.0209	.0206	.0202	.0197	.0193	.0188	.0183	.0179	760
770	.0227	.0224	.0221	.0218	.0215	.0212	.0208	.0204	.0200	.0196	.0192	.0187	.0182	.0177	770
780	.0225 <sup>+</sup>	.0223	.0220	.0217	.0214	.0210	.0207	.0203	.0199	.0195	.0190	.0186	.0181	.0176	780
790	.0224	.0221	.0218	.0215 <sup>+</sup>	.0212	.0209	.0205 <sup>+</sup>	.0202	.0198	.0194	.0189	.0185	.0180	.0175 <sup>+</sup>	790
800	.0222	.0220	.0217	.0214	.0211	.0208	.0204	.0200	.0196	.0192	.0188	.0184	.0179	.0174	800
810	.0221	.0218	.0216	.0213	.0210	.0206	.0203	.0199	.0195 <sup>+</sup>	.0191	.0187	.0182	.0178	.0173	810
820	.0220	.0217	.0214	.0211	.0208	.0205 <sup>+</sup>	.0201	.0198	.0194	.0190	.0186	.0181	.0177	.0172	820
830	.0218	.0216	.0213	.0210	.0207	.0204	.0200	.0197	.0193	.0189	.0185	.0180	.0176	.0171	830
840	.0217	.0214	.0212	.0209	.0206	.0203	.0199	.0195 <sup>+</sup>	.0192	.0188	.0183	.0179	.0175	.0170	840
850	.0216	.0213	.0211	.0208	.0205	.0201	.0198	.0194	.0191	.0187	.0182	.0178	.0174	.0169	850
860	.0214	.0212	.0209	.0206	.0203	.0200	.0197	.0193	.0189	.0185 <sup>+</sup>	.0181	.0177	.0172	.0168	860
870	.0213	.0211	.0208	.0205 <sup>+</sup>	.0202	.0199	.0196	.0192	.0188	.0184	.0180	.0176	.0172	.0167	870
880	.0212	.0210	.0207	.0204	.0201	.0198	.0195	.0191	.0187	.0183	.0179	.0175	.0171	.0166	880
890	.0211	.0208	.0206	.0203	.0200	.0197	.0193	.0190	.0186	.0182	.0178	.0174	.0170	.0165	890
900	.0210	.0207	.0205	.0202	.0199	.0196	.0192	.0189	.0185 <sup>+</sup>	.0181	.0177	.0173	.0169	.0164	900
910	.0208	.0206	.0203	.0201	.0198	.0195	.0191	.0188	.0184	.0180	.0176	.0172	.0168	.0163	910
920	.0207	.0206	.0202	.0200	.0197	.0194	.0190	.0187	.0183	.0179	.0175 <sup>+</sup>	.0171	.0167	.0162	920
930	.0206	.0204	.0201	.0199	.0196	.0193	.0189	.0186	.0182	.0178	.0174	.0170	.0166	.0161	930
940	.0205 <sup>+</sup>	.0203	.0200	.0197	.0195	.0191	.0188	.0185	.0181	.0177	.0173	.0169	.0165	.0161	940
950	.0204	.0202	.0199	.0196	.0194	.0190	.0187	.0184	.0180	.0176	.0173	.0168	.0164	.0160	950
960	.0203	.0201	.0198	.0195 <sup>+</sup>	.0193	.0189	.0186	.0183	.0179	.0176	.0172	.0168	.0163	.0159	960
970	.0202	.0200	.0197	.0194	.0192	.0188	.0185 <sup>+</sup>	.0182	.0178	.0175	.0171	.0167	.0162	.0158	970
980	.0201	.0199	.0196	.0193	.0191	.0188	.0184	.0181	.0177	.0174	.0170	.0166	.0162	.0157	980
990	.0200	.0198	.0195	.0192	.0190	.0187	.0183	.0180	.0177	.0173	.0169	.0165	.0161	.0156	990
1000	.0199	.0197	.0194	.0191	.0189	.0186	.0182	.0179	.0176	.0172	.0168	.0164	.0160	.0156	1000

## PROPORTIONAL PARTS TO ENTRIES, page 33

Correction  $\Delta p =$  Proportional Part of  ${}_N\Delta p +$  Proportional Part of  ${}_r\Delta p$ .  
 (This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  ${}_N\Delta p$  for  $\delta N$ , if  $N =$  size of population.

${}_N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18
3	03	06	09	12	15	18	21	24	27

Proportional Parts of  ${}_r\Delta p$  for  $\delta r$ , if  $r =$  coefficient of correlation.

${}_r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450

TABLE B (continued)

Coefficient of Correlation  $r$  $r = .52 \text{ to } .76$  $N = 550 \text{ to } 1000$ 

$N$	.52	.54	.56	.58	.60	.62	.64	.66	.68	.70	.72	.74	.76	$N$
550	.0210	.0204	.0197	.0191	.0184	.0177	.0170	.0162	.0155	.0147	.0139	.0130	.0121	550
560	.0208	.0202	.0196	.0189	.0182	.0175	.0169	.0161	.0153	.0145	.0137	.0129	.0120	560
570	.0206	.0200	.0194	.0187	.0181	.0174	.0167	.0159	.0152	.0144	.0136	.0128	.0119	570
580	.0204	.0198	.0192	.0186	.0179	.0172	.0165	.0158	.0151	.0143	.0135	.0127	.0118	580
590	.0203	.0197	.0191	.0184	.0178	.0171	.0164	.0157	.0149	.0142	.0134	.0126	.0117	590
600	.0201	.0195	.0189	.0183	.0176	.0170	.0163	.0155	.0148	.0140	.0133	.0125	.0116	600
610	.0199	.0193	.0187	.0181	.0175	.0168	.0161	.0154	.0147	.0139	.0132	.0124	.0115	610
620	.0198	.0192	.0186	.0180	.0173	.0167	.0160	.0153	.0146	.0138	.0130	.0123	.0114	620
630	.0196	.0190	.0184	.0178	.0172	.0165	.0159	.0152	.0144	.0137	.0129	.0122	.0114	630
640	.0195	.0189	.0183	.0177	.0171	.0164	.0157	.0150	.0143	.0136	.0128	.0121	.0113	640
650	.0193	.0187	.0182	.0176	.0169	.0163	.0156	.0149	.0142	.0135	.0127	.0120	.0112	650
660	.0192	.0186	.0180	.0174	.0168	.0162	.0155	.0148	.0141	.0134	.0126	.0119	.0111	660
670	.0190	.0185	.0179	.0173	.0167	.0160	.0154	.0147	.0140	.0133	.0125	.0118	.0110	670
680	.0189	.0183	.0178	.0172	.0166	.0159	.0153	.0146	.0139	.0132	.0125	.0117	.0109	680
690	.0187	.0182	.0176	.0170	.0164	.0158	.0152	.0145	.0138	.0131	.0124	.0116	.0108	690
700	.0186	.0181	.0175	.0169	.0163	.0157	.0151	.0144	.0137	.0130	.0123	.0115	.0108	700
710	.0185	.0179	.0174	.0168	.0162	.0156	.0149	.0143	.0136	.0129	.0122	.0115	.0107	710
720	.0183	.0178	.0173	.0167	.0161	.0155	.0148	.0142	.0135	.0128	.0121	.0114	.0106	720
730	.0182	.0177	.0171	.0166	.0160	.0154	.0147	.0141	.0134	.0127	.0120	.0113	.0105	730
740	.0181	.0176	.0170	.0165	.0159	.0153	.0146	.0140	.0133	.0126	.0119	.0112	.0105	740
750	.0180	.0174	.0169	.0163	.0158	.0152	.0145	.0139	.0132	.0126	.0119	.0111	.0104	750
760	.0179	.0173	.0168	.0162	.0157	.0151	.0144	.0138	.0132	.0125	.0118	.0111	.0103	760
770	.0177	.0172	.0167	.0161	.0156	.0150	.0144	.0137	.0131	.0124	.0117	.0110	.0103	770
780	.0176	.0171	.0166	.0160	.0155	.0149	.0143	.0136	.0130	.0123	.0116	.0109	.0102	780
790	.0175	.0170	.0165	.0159	.0154	.0148	.0142	.0135	.0129	.0122	.0115	.0108	.0101	790
800	.0174	.0169	.0164	.0158	.0153	.0147	.0141	.0135	.0128	.0122	.0115	.0108	.0101	800
810	.0173	.0168	.0163	.0157	.0152	.0146	.0140	.0134	.0127	.0121	.0114	.0107	.0100	810
820	.0172	.0167	.0162	.0156	.0151	.0145	.0139	.0133	.0127	.0120	.0113	.0106	.0099	820
830	.0171	.0166	.0161	.0155	.0150	.0144	.0138	.0132	.0126	.0119	.0112	.0105	.0098	830
840	.0170	.0165	.0160	.0154	.0149	.0143	.0137	.0131	.0125	.0119	.0112	.0105	.0098	840
850	.0169	.0164	.0159	.0154	.0148	.0142	.0137	.0131	.0124	.0118	.0111	.0104	.0097	850
860	.0168	.0163	.0158	.0153	.0147	.0142	.0136	.0130	.0124	.0117	.0111	.0104	.0097	860
870	.0167	.0162	.0157	.0152	.0146	.0141	.0135	.0129	.0123	.0117	.0110	.0103	.0096	870
880	.0166	.0161	.0156	.0151	.0146	.0140	.0134	.0128	.0122	.0116	.0110	.0103	.0096	880
890	.0165	.0160	.0155	.0150	.0145	.0139	.0133	.0127	.0121	.0115	.0109	.0102	.0095	890
900	.0164	.0159	.0154	.0149	.0144	.0138	.0133	.0127	.0121	.0115	.0109	.0102	.0095	900
910	.0163	.0158	.0153	.0148	.0143	.0138	.0132	.0126	.0120	.0114	.0108	.0101	.0094	910
920	.0162	.0157	.0152	.0147	.0142	.0137	.0131	.0125	.0119	.0113	.0107	.0100	.0093	920
930	.0161	.0156	.0151	.0146	.0141	.0135	.0130	.0124	.0118	.0112	.0106	.0099	.0092	930
940	.0161	.0156	.0151	.0146	.0141	.0135	.0130	.0124	.0118	.0112	.0106	.0099	.0092	940
950	.0160	.0155	.0150	.0145	.0140	.0134	.0129	.0123	.0117	.0111	.0105	.0098	.0091	950
960	.0159	.0154	.0149	.0144	.0139	.0133	.0128	.0122	.0116	.0110	.0104	.0097	.0090	960
970	.0158	.0153	.0148	.0143	.0138	.0133	.0127	.0121	.0115	.0109	.0103	.0096	.0089	970
980	.0157	.0152	.0147	.0142	.0137	.0132	.0126	.0120	.0114	.0108	.0102	.0095	.0088	980
990	.0156	.0151	.0146	.0141	.0136	.0131	.0125	.0119	.0113	.0107	.0101	.0094	.0087	990
1000	.0156	.0151	.0146	.0141	.0136	.0131	.0125	.0119	.0113	.0107	.0101	.0094	.0087	1000

## TABLES OF THE PROBABLE ERROR OF

## PROPORTIONAL PARTS TO ENTRIES, page 35

Correction  $\Delta p$  = Proportional Part of  ${}_N\Delta p$  + Proportional Part of  ${}_r\Delta p$ .  
 (This is to be *subtracted* after adjustment of decimal place)

Proportional Parts of  ${}_N\Delta p$  for  $\delta N$ , if  $N$  = size of population.

${}_N\Delta p$	1	2	3	4	5	6	7	8	9
1	01	02	03	04	05	06	07	08	09
2	02	04	06	08	10	12	14	16	18

Proportional Parts of  ${}_r\Delta p$  for  $\delta r$ , if  $r$  = coefficient of correlation.

${}_r\Delta p$	0	1	2	3	4	5	6	7	8	9
1	00	05	10	15	20	25	30	35	40	45
2	00	10	20	30	40	50	60	70	80	90
3	00	15	30	45	60	75	90	105	120	135
4	00	20	40	60	80	100	120	140	160	180
5	00	25	50	75	100	125	150	175	200	225
6	00	30	60	90	120	150	180	210	240	270
7	00	35	70	105	140	175	210	245	280	315
8	00	40	80	120	160	200	240	280	320	360
9	00	45	90	135	180	225	270	315	360	405
10	00	50	100	150	200	250	300	350	400	450
11	00	55	110	165	220	275	330	385	440	495
12	00	60	120	180	240	300	360	420	480	540





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